

2015 IFTOMM NEWSLETTER



International Federation for the Promotion of
Mechanism and Machine Science
www.iftomm.org

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SCOPE OF THE NEWSLETTER

This Newsletter reports the most important facts and events of IFToMM activity during the year but with an eye to the future plans. Information is collected mainly from IFToMM bodies and its leadership. A special attention list is devoted to forthcoming conference as forum for meetings among the community and promotion of MMS.

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EDITORIAL BOARD FOR 2015 ISSUE

Shuo Hung Chang, Chair of editorial board, EC member
Yoshihiko Nakamura, IFToMM President
Marco Ceccarelli, previous IFToMM President
Veniamin I. Goldfarb, Chair of PC Communications & Publications & Archiving, IFToMM Vice President
Jean Pierre Merlet, EC member
Teresa Zielinska, Secretary General

MESSAGE OF THE IFTOMM PRESIDENT

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MESSAGE OF THE IFToMM VICE PRESIDENT (2011-2015)

Prof. Veniamin GOLDFARB
IFToMM Vice-President (2012-2015)
EC member (2008-2015)
Chair of PC CPA (2012-2015)
Chair of TC for Gearing and Transmissions (1997-2004)
Prof., Dr. Sc., Director of Institute of Mechanics.
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Dear colleagues, dear friends,
First of all I would like to cordially thank all of you, especially Prof. Yoshihiko Nakamura, Prof. Marco Ceccarelli, Prof. Teresa Zielinska for long-term cooperation, business-friendly working atmosphere of our meetings, for joint efforts to development and prosperity of our science of machines and mechanisms and IFToMM.

The past several years of joint cooperation will remain the most interesting for me within the years of my creative work. My activity at the position of IFToMM Vice-president and the Chair of the Permanent Commission for Communications, Publications, and Archiving (PC CPA) was thoroughly reported annually during 2012-2015 within annual reports available at the IFToMM official webpage.

I want to emphasize here the most essential results obtained during the pointed period.

1. The new administrative group (headed by PhD Natalya Barmina) was organized to control and upgrade the IFToMM webpage. Thanks to accurate and effective activity of the group tremendous work has been done during this period. All these activities simplified significantly the information exchange, enhanced communication possibilities within IFToMM. Note here, that it was achieved to a great extent because of efforts of the head of group Natalya Barmina and sponsoring support of the Institute of mechanics of ISTU.
2. The international students Olympiad activity has been started and worthfully continued. I am sure that organizing SIO MMS will remain a continuous tradition and it will be attracting greater and greater number of youth: students, young scientists for more profound studying and development of MMS.

3. Another important achievement of PC CPA activity is fruitful and well-organized activity on publishing the annual Newsletter executed by the Editorial Board headed by Prof. Shuo Hung Chang.
4. The proposal was made to apply wider the advanced internet techniques to promote information about IFToMM and EC activity. In particular, articles were added to Wikipedia:

http://en.wikipedia.org/wiki/International_Federation_for_the_Promotion_of_Mechanism_and_Machine_Science -

English version

http://ru.wikipedia.org/wiki/Международная_Федерация_по_Теории_Механизмов_и_Машин-Russian version

I hope, this proposal will get further development.

5. The proposal was prepared and offered for further discussion related to strengthening and formalization of cooperation with industry. It can be (and it often happens) the sponsor of holding the conferences, youth schools etc., of performing scientific programs and many other activities.
6. The proposal was made to return to the previously functioning system of PC CPA activity: PC for Communications, PC for Publications separately, and PC for Archiving in the structure of the PC for History. All these three directions will be surveyed by the Vice-President, who can simultaneously be the Chair of the PC for Communications, for example.

A lot of work should be done further for development and strengthening the international authority of IFToMM. I wish a new President and all EC members great success in this high-minded and challenging activity and I wish all colleagues and friends good health and happiness.

NEWS FROM EXECUTIVE COUNCIL

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NEWS FROM MEMBER ORGANIZATIONS

[A total of 28 reports]

MO ARMENIA

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REPORT OF ACTIVITY: from November 1, 2014 to November 1, 2015

1- DISCUSSION OF RECENT ACTIVITIES

Four MMS research projects have been implemented in the reported period supported by the grants of the State Science Committee (SCS) of Armenia:

1. Development of the theory and computational methods of approximations synthesis for the parallel manipulators with limited mobility (Project leader: Prof. Yuri Sargsyan, completed on 30.06.2015),
2. Developing engineering methods for investigation of the processes of sintered blank treatment by pressure and study of corresponding stress-strain states (Project leader: Prof. Gevork Petrosyan, completed on 30.06.2015),
3. Development of new technical solutions and design methodology for multipurpose microrobots and medical robots of hybrid structure (research laboratory “Robotics”, director: Prof. Yuri Sargsyan),
4. Developing polymer-based friction materials and machine parts from local raw materials and minerals (research laboratory “Tribology”, director: Prof. Norik Meliksetyan).

Two new grant applications are submitted to the State Science Committee (SCS) of Armenia:

1. Approximations synthesis of parallel modular robotic mechanisms for the approximate generation of prescribed multiphase motions (Project leader: Prof. Yuri Sargsyan),
2. Stress-strain state study of plastic bending of the sintered sheet by analytical, computer- aided and experimental methods (Project leader: Prof. Gevork Petrosyan).
 - Two Ph.D. dissertations have been defended in MMS related areas.
 - Two issues of SEUA Proceedings , Series “Mechanics, machine science, machine-building” have been published.

2- MEETINGS AND VISITS

- Two meetings of the National Committee of IFToMM, Armenia have been organized in the reported period.
- Mutual visits and meetings of MMS researchers from INSA, Rennes, France and SEUA, Armenia have been implemented in frames of the scientific collaboration agreement between two institutions.

3- RESEARCH COLLABORATION AND EXCHANGES

- SNRS, France/SCS, Armenia research collaboration project “Development of new wearable walking assist devices with bodyweight support” (Armenian Project leader: Prof. Mikayel Harutyunyan). Mutual visits between project participants have been implemented, according to the Project work- plan.

4- CONFERENCE EVENTS

International conference «Machine-building technologies and automation equipment - 2014» coorganized by the Ministry of Higher Education and Science, Armenia, State Engineering University of Armenia (at present National

Polytechnical University of Armenia), International Union of Machine-Building (IUMB), IFToMM, Armenia National Committee and other Institutions, Yerevan, July, 2014.

5- MOST RELEVANT PUBLICATIONS (no more than 10)

The publication format is following:

1. Sarkissyan Y.L. - Rigid Body Points Approximating Concentric Spheres in Alternating Sets of its Given Positions - 2015 - Reports, NAS RA, No.2, pp. 110-118.
2. Sarkissyan Y.L., Stepanyan K.G., Verlinski S.V. Rigid Body Points Approximating Concentric Circles In Given Sets Of Its Planar Displacements, Proceedings of the 14th IFToMM World Congress, Taipei, Taiwan, 2015.
3. Sarkissyan Y.L., Darbinyan H. Unified Task Based Conceptual and Parametric Design Methodology. Proceedings of the 14th IFToMM World Congress, Taipei, Taiwan, 2015.
4. Harutyunyan M.G., Stepanyan K.G., Sarkissyan Y.L. Approximate synthesis of a planar adjustable manipulator using a minimax criterium of accuracy. Proc. of XXII Scientific-Techn. Conference "Machine Building and Technosphere in XXI Century", 14-19 of September, 2015, Donetsk-Sevastopol. —No 1. – pp. 11-14.
5. Stakyan M.G., Chibukhchyan S.S. The Reliability of Mechanical Systems and Logistics Equipment. Mechanization of Construction (Moscow), - 2015, No 2.- pp. 30-33.
6. Petrosyan G.L., Petrosyan V.G., Levonyan H.L. Investigation of the process of hot pressing of pipes made from porous materials in conic matrixes by analytical and numerical methods. Izvestia NAS RA and NPUA. Series of Technical Sciences. – 2015, V. 68, No 3.

6- FUTURE PLANNED ACTIVITIES

- 2 IFToMM National Committee meetings are planned for 2016,
- Reconstruction of the IFToMM Armenia web-page in NPUA web-site.

7- OTHER RELEVANT INFORMATION

NPUA (former SEUA) offers MMS based study programs in Applied Mechanics at BE, ME and Doctoral levels.

MO BELARUS

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REPORT OF ACTIVITY: from November 20, 2014 to November 30, 2015.

1- DISCUSSION OF RECENT ACTIVITIES

The basic directions of activity are as follows:

- Coordination of Belarussian researchers and technicians from the academic organizations, universities and the industrial enterprises in area of mechanics of machines;
- Participation in work of committees and commissions IFToMM;
- Development of the international contacts;
- Organization of scientific conferences;
- Participation in issues of the following journals:

1) Journal "Mechanics of Machines, Mechanisms and Materials" <http://oim.by/ru/zhurnal> (in Russian), http://oim.by/en/Journal_en/ and <http://mmmm.by/en/>.

2) Friction and Wear <http://mpri.org.by/editions/friction-a-wear.htm> (in Russian), Impact-factor 0,475.

Journal of Friction and Wear is reedited in English by Allerton Press, Inc.:

<http://www.allertonpress.com/cgi/journal.pl?jid=9>.

Electronic version of Journal is distributed by Springer:

<http://www.springer.com/physics/classical+continuum+physics/journal/11959>.

2- MEETINGS AND VISITS

- Two Belarussian scientists (Academician N. Myshkin and Professor V. Algin) took part in the IFToMM 2015 World Congress in Taipei.
- Nine reports have been presented by Belarussian scientists from Joint Institute of Mechanical Engineering and Metal-Polymer Research Institute of the NASB during the IFToMM Workshop on History of Machine and Mechanism Science (Saint-Petersburg, Russia, May 26-28, 2015) (<http://hmms2015.ru>).

3- RESEARCH COLLABORATION AND EXCHANGES

- New agreements have been concluded between the Joint Institute of Mechanical Engineering of the National Academy of Science of Belarus (NASB) and European National University n.a. L.N. Gumilev (Kazakhstan) as well as Rybinsk State Aviation Technical University n.a. P.A. Solovov. As a result the exchange of staff between the organizations was held.
- Some scientists from Belarussian Committee of IFToMM are members of international scientific journals in field of Mechanical Engineering. For example, Prof V. Algin is a member of Editorial Boards of "China Journal of Mechanical Engineering" (China), "Problems of Mechanics" (Georgia) and Technology of Wheeled and Tracked Machines" (Russia); Dr S. Shil'ko is a member of Editorial Boards of "Russian Journal of Biomechanics" (Russia) and "American Journal of Mechanics and Applications" (USA).
- Joint Institute of Mechanical Engineering of the NASB as a publisher of the journal "Mechanics of Machines, Mechanisms and Materials" (Belarus) exchanges issues with publishers of journals "Problems of Mechanics" (Georgia) and "Strength of Materials" (S. Pisarenko Institute for Problems of the National Academy of Science of Ukraine" (Ukraine) as well as "Physical

Mesomechanics” (Siberian Branch of the Russian Academy of Sciences, Russia).

- Metal-Polymer Research Institute of the NASB as a publisher of the journal “Friction and Wear” exchanges issues with publishers of journals “Russian Journal of Biomechanics” (Russia), “Mechanics of Composite Materials” (Latvia), “Physical Mesomechanics” (Siberian Branch of the Russian Academy of Sciences, in Russian) as well as Journal “Strength of Materials” (Ukraine, in Russian).

4- CONFERENCE EVENTS

- The International scientific and technical conference “Innovations in Mechanical Engineering 2015” has been held on October 1-2, 2015 in Minsk as the main event in a field of Mechanism and Machine Science in Belarus. The Joint Institute of Mechanical Engineering of the NASB, which patronizes the Belarusian Committee of IFToMM, was a host of the Conference (http://oim.by/dfiles/000771_694953_programma_2015.pdf). About 200 attendees from Belarus, Russia, Ukraine, Kazakhstan and Georgia took part at the Conference, and more than 100 reports have been presented. These reports will be published by Joint Institute of Mechanical Engineering in the collection of proceedings “Actual Issues of Machines Science” at the end of 2015 (<http://oim.by/ru/news?id=279>).
- The VII International Symposium on Tribo-Fatigue ISIF 2015 has been held on November 26-27, 2015 in Gomel, Belarus.

5- MOST RELEVANT PUBLICATIONS

1. Goldade V., Shil’ko S., Neverov A. *Smart Materials Taxonomy*. CRC Press, Taylor & Francis Group, 2015. – 277 p.
2. Shil’ko S.V., Starzhinsky V.E., Petrokovets E.M. *Methods and Results of Composite Gears Design. Theory and Practice of Gearing and Transmissions. In Honor of Professor Faydor L. Litvin*. Editors: Goldfarb V., Barmina N. (Eds.). SPRINGER, Scopus, 2015. V. 34. P. 341-368. (www.springer.com/gp/book/9783319197395).
3. Proceedings of the Scientific Seminar “*Terminology for the Mechanism and Machine Science*”. Edited by Eugeni Shalobaev and Victor Starzhinsky. 25th Working Meeting of IFToMM Permanent Commission for Standardization of Terminology on MMS, Saint-Petersburg, Russia, June 25-29, 2014. Saint-Petersburg – Gomel. – 2015. – 138 p.
4. Algin V.B. *From Newton’s Mechanics to Dynamics of Regular Mechanical Systems with Variable States and Power Flows*. Proceeding of the 14th IFToMM World Congress, Taipei, Taiwan, October 25-30, 2015. DOI Number: 10.6567/IFToMM.14TH.WC.OS12.005 (<http://elite.newhopetek.com.tw/IFToMM2015CD/PDF/OS12-005.pdf>).
5. Myshkin N.K., Grigoriev A.Ya. *Scale Factor in Tribology: Roughness and Texture*. Proceeding of the

14th IFToMM World Congress, Taipei, Taiwan, October 25-30, 2015. DOI Number:

10.6567/IFToMM.14TH.WC.OS18.002

(<http://elite.newhopetek.com.tw/IFToMM2015CD/PDF/OS18-002.pdf>).

6- FUTURE PLANNED ACTIVITIES

VII Belarusian Congress of Theoretical and Applied Mechanics “Mechanics-2015” (October 2015, Minsk, Belarus) will be the main event in the field of TMM in Belarus. The Joint Institute of Mechanical Engineering of the NASB will be a host of the Conference.

The Congress is organized under the support of the NASB, State Science and Technology Committee, Ministry of Industry, and Ministry of Education of Belarus. Congress general topics are: Mechanics of machines; Dynamics, strength, and durability of machines and constructions; Technological mechanics.

Proceeding of the Congress will be published by Joint Institute of Mechanical Engineering of the NASB in the collection of proceedings “Actual Issues of Machines Science” (<http://oim.by/ru/sbornik/>).

7- RELEVANT PHOTOGRAPHS, FLYERS etc.:

International Scientific and Technical Conference “Innovations in Mechanical Engineering 2015” (Minsk, Belarus): <http://oim.by/ru/news?id=279>.

MO BRAZIL

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REPORT OF ACTIVITY: from January to December 2015

1- DISCUSSION OF RECENT ACTIVITIES

Activities on the field of MMS and IFToMM in Brazil have been done under patronage of the Brazilian Society of Mechanical Sciences and Engineering – ABCM.

Others activities on the field of MMS has been organized with the Brazilian Society on Automatics – SBA and the Brazilian Society of Applied and Computational Mathematics – SBMAC. The Brazil IFToMM TC and PC representatives are ABCM members.

2- MEETINGS AND VISITS

On each event under the patronage of ABCM is organized a special session to discuss Engineering and Mechanical Science education in Brazil, both undergraduate and postgraduate programs, for improving the quality and its international impact, and the development of research activities in Educational Institutions. Two meetings had been organized about this subject: the *National Meeting for Mechanical Engineering Coordinators – ENECEM 2015* and the *Symposium on Science, Technology and Innovation of Mechanical Engineering in Brazil*, organized by the Permanent Commission on Science and Technology of ABCM.

November 19, 2015

3-RESEARCH COLLABORATION AND EXCHANGES

Brazilian members of IFToMM TCs and PCs have taken part in several events and meetings during the period like the IFToMM 2015 World Congress, and have collaborative projects in the educational area (undergraduate and postgraduate programs) and research activities with IFToMM and non IFToMM members.

4- CONFERENCE EVENTS

The following scientific events had been organized on MMS:

- **3rd International Symposium on Uncertainty Quantification and Stochastic Modeling UNCERTAINTIES 2015, organized by the ABCM Committee of Stochastic Modeling and Uncertainty Quantification**, under the auspices of ABCM and SBMAC. February 15-19.
- 17th International Symposium on Dynamic Problems of Mechanics – DINAME 2015, organized by ABCM Committee on Dynamics. February 22-27.
- National Meeting on Biomechanics Engineering - ENEBI 2015, organized by ABCM Committee on Bioengineering. May 5-8 .
- 22nd National Congress of Mechanical Engineering Students - CREEM 2015. October 19-23.
- **Brazilian Conference on Dynamics, Control and Applications - DINCON 2015**, under the auspices of ABCM and SBMAC. October 25-28.
- The 23rd ABCM International Congress of Mechanical Engineering – COBEM 2015. December 6-11.
- International Conference on Nonlinear Dynamics, Chaos, Control and Applications in Engineering - ICONNE 2015, organized by the **ABCM Committee of Non-linear Phenomena**. December 6-11.

5- FUTURE PLANNED ACTIVITIES

Future planned activities: Promote co-sponsored events by IFToMM and ABCM, like the 6th IFToMM-FelbIM International Symposium on Multibody Systems and Mechatronics MUSME 2017, and the 10th IFToMM Int. Conference on Rotor Dynamics to be held on 2018. Increase the participation of Brazilian members on activities promoted by IFToMM, and to implement actions to encourage students on MMS.

6- OTHER RELEVANT INFORMATION

ABCM grants awards to recognize the contribution of individuals and institutions to the development of mechanical engineering in Brazil. In this year ABCM granted the ABCM / EMBRAER awards for the best Undergraduated, MSc and PhD thesis.

MO CANADA

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REPORT OF ACTIVITY: from November 14, 2014 to

1- DISCUSSION OF RECENT ACTIVITIES

CCToMM enjoyed a productive year since the last MO Activity Short Report. There are five major items that will be summarized in this report. First, the 2015 CCToMM M³ was held at Carleton University, in Ottawa, Canada, May 28-29, 2015. The symposium was co-hosted by the University of Ottawa and by Carleton University. Second, the Annual General Meeting (AGM) of MO members was held in Ottawa, Canada on May 29, 2015. Details and outcomes of the AGM will be discussed. Thirdly, the annual CCToMM Symposium for Mechanisms, Machines, and Mechatronics (M³) will be held at the University of British Columbia, Kelowna Campus in June 2016. Lastly, the 2017 CCToMM M³ is being planned, and will be held at École Polytechnique de Montréal, in Montréal, Canada, May 2017

2- MEETINGS AND VISITS

The 2015 CCToMM AGM was held at Carleton University on May 29, 2015. Twenty members were in attendance, along with the Executive Council (EC). Several significant issues were discussed.

John Hayes wrote an e-mail to Zuomin Dong on April 30th 2015 to reiterate the CCToMM's request that its share of the profits from the 2010 CSME Forum be paid as per the memorandum of understanding (MOU) between the CSME and the CCToMM. Zuomin Dong replied promptly that he would investigate the status of the payment. Following an e-mail reminder sent by John Hayes to Zuomin Dong on May 26th, 2015, the latter has indicated that a payment by cheque has been mailed to the CCToMM.

John Hayes contacted Paul Zsombor-Murray, Editor of the CSME Transactions, to inquire about the possibility of a special issue of the transactions being published from papers presented at the 2015 CCToMM M³ Symposium. This resulted in an invitation for John Hayes and Éric Lanteigne to act as co-guest editors for a special issue of the CSME Transactions and to oversee a second review process for the papers selected to be published. The authors of those papers presented at the 2015 CCToMM M³ Symposium that are selected for publication in the special issue of the CSME Transactions will be invited to send revised manuscripts in the coming months.

Scott Nokleby has posted the proceedings for all past CCToMM M³ Symposia on the CCToMM website (with the exception of the 2011 symposium which will soon be added).

The 2016 CSME International Congress will take place in Kelowna, BC (dates yet to be determined). John Hayes encouraged all CCToMM members to submit papers to the 2016 CCToMM M³ Symposium which is to be held in conjunction with the CSME International Congress. It was also indicated that the CCToMM will need to appoint one of its members to represent its interests within the 2016 CSME International Congress organizing committee. Éric Lanteigne accepted the nomination, and will accompany John Hayes to the CSME Board of Directors meeting in October 2015 in Montreal to establish the logistics.

Joshua Pickard expressed his desire to renew his mandate as CCToMM Student Representative. Jérémie Léger, for his part, mentioned that he is not seeking a new mandate. Nominations were requested for bilingual candidates interested in the position of CCToMM student representative. Ugo Chouinard was the only nominee.

Marc Arsenault briefly described the creation of the Student Delegates Awards (SDA) program including its eligibility requirements, funding levels and method of recipient selection. A budget of \$2,000 was allocated to the SDA for the 2015 CCToMM M³ Symposium and a total of seven (7) applications were received. Given the allocated budget, all applicants received awards. When combined with the travel assistance that is automatically provided to CCToMM Student Representatives, a total of \$1,600 was distributed to students in order to support their participation in the 2015 CCToMM M³ Symposium.

André Gallant inquired as to why the student best paper competition that had been initiated at the 2011 CCToMM M³ Symposium had not been continued in subsequent symposia. It was explained by John Hayes that its omission from recent symposia was not deliberate and that it would be reinstated for the 2017 CCToMM M³ Symposium.

John Hayes provided a summary of the relationship between the CCToMM and the CSME. It was explained to the members present that the CCToMM EC had met earlier to discuss this relationship and the challenges it has presented in the past. The conclusion of this discussion was that the CCToMM should request a high-level seat on the organizing committee of future CSME International Congresses starting in 2016. The CCToMM member appointed to this role would work with the CSME International Congress Organizing committee to promote the congress as well as to organize and manage the paper review process.

Jorge Angeles provided additional background information regarding the CCToMM/CSME relationship dating back to 1991, including some information regarding the MOU signed by the CCToMM and the CSME in 2010. He suggested the possibility of an updated MOU being signed between the two parties to increase awareness of its existence within the CSME.

John Hayes suggested that the CCToMM should consider having its own call for papers specific to the CCToMM M³ Symposium when it is held in conjunction with the CSME International Congress.

John Hayes mentioned that he would not be able to attend the CSME Board of Directors meeting in June 2015 due to personal reasons. Jorge Angeles accepted to act as a proxy for John Hayes at this meeting.

The location of the 2017 CCToMM M³ Symposium was discussed and it was suggested that the symposium would benefit from a return to Québec in order to increase attendance. Lionel Birglen and Luc Baron suggested that the 2017 CCToMM M³ Symposium be hosted by the École Polytechnique (Montréal, QC) and agreed to co-chair the event. Juan Carretero suggested that other conferences be considered when choosing the dates of the 2017 CCToMM M³ Symposium. In particular, a conflict with the IEEE

ICRA, scheduled from May 29th to June 2nd 2017, should be avoided.

Juan Carretero announced that he was seeking a new mandate on the IFToMM EC. He encouraged all CCToMM members who will be attending the upcoming IFToMM World Congress in Taipei, Taiwan, to attend the IFToMM General Assembly (GA).

John Hayes, Chair of CCToMM, the Canadian MO cannot attend the GA. Jozsef Kovacs from McGill University agreed to serve as proxy voting delegate for Canada at the GA.

3- CONFERENCE EVENTS

The 2015 CCToMM M³ was held at Carleton University in Ottawa, Canada, May 28-29, 2015. The event attracted 18 full papers and one extended. Eleven papers were selected for submission to a Special Issue of the Transactions of the Canadian Society for Mechanical Engineering: 2016, Vol. 40, No. 1.

4- MOST RELEVANT PUBLICATIONS (no more than 10)

Transactions of the Canadian Society for Mechanical Engineering, Special Issue of Papers Selected From the 2015 CCToMM Symposium on Mechanisms, Machines, and Mechatronics, M.J.D. Hayes and E. Lanteigne Guest Editors, Volume 40, Issue No. 1, 2016.

5- FUTURE PLANNED ACTIVITIES

The 18th CCToMM Symposium for Mechanisms, Machines, and Mechatronics will be held at the University of British Columbia in Kelowna, B.C., in June 2016.

The 19th CCToMM Symposium for Mechanisms, Machines, and Mechatronics will be held at École Polytechnique de Montréal, in Montréal in late May, 2017.

MO CHINA-TAIPEI

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REPORT OF ACTIVITY: from November 1, 2014 to October 31, 2015

1- DISCUSSION OF RECENT ACTIVITIES

On September 9th, 2015, the 17th Taiwan Innovative Mechanism Design Competition sponsored by the Department of Industrial Technology of Ministry of Economic Affairs Taiwan was held at Cycling & Health Tech Industry R&D Center, Taichung, Taiwan with the Chinese Society of Mechanism and Machine Theory (CSMMT) for the final cycle. In the first cycle, 48 pieces were received for this competition, and 15 of these 48 works were recommended to the final cycle competition on September 9th. Among the 15 mechanism designs, 10 pieces were selected, and they were awarded on October 28th, 2015 with the 2015 annual conference of CSMMT (Chinese Society of Mechanism and Machine Theory) that was held at Taipei International Convention Center, Taipei, Taiwan.

2- CONFERENCE EVENTS

The IFToMM 2015 World Congress was successfully held in Taipei on October 25 for five days. We had approximately 700 delegates from 45 countries/regions for presentation of 522 papers. The Congress program included 78 technical sessions, one special session and several technical forums on the themes of industry 4.0, intelligent automation, intelligent machine tools, and micro-fabrication technologies. It was a great and successful Congress, and I also hope that it was a memorable visit for those who joined this event during their stay in Taipei.

Together with the IFToMM 2015 World Congress held in Taipei, the 2015 annual conference of CSMMT was held on October 28, 2015 at Taipei International Convention Center, Taipei, Taiwan. There were about 60 papers presented, and Prof. Jian S Dai, Head of the Center for Mechatronics and Manufacturing Systems, School of Physical Sciences and Engineering, King's College London, University of London, was the keynote speaker.

MO CROATIA

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REPORT OF ACTIVITY: from December 3, 2014 to December 5, 2015

The main activity in 2015 of Member Organization Croatia is the meeting held at Faculty of Mechanical Engineering and Naval Architecture, University of Zagreb, Croatia. Throughout the year, 6 meetings were held. Each *meeting was accompanied with lectures, related to MMS activities, given by speakers who are scientists or experts from universities and industry.* Furthermore, three members of MO Croatia attended at the 14th IFToMM World Congress in Taipei, Taiwan and presented two papers. Throughout the year, we have pursued our ongoing efforts to enhance industry and academia collaboration on MMS-related topics.



In 2015 IFToMM General Assembly, Oct. 28, 2015, Taipei, Taiwan

MO CZECH REPUBLIC

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REPORT OF ACTIVITY: from November 2014 to November 2015

1- DISCUSSION OF RECENT ACTIVITIES

In the year 2015, the Czech National Committee IFToMM had its regular session during the conference “Engineering Mechanics 2015” held in Svratka in May. Main topics were again some personal changes in the members of this MO body and again nominations of the Czech researchers to the Technical IFToMM Committees (TC). Jaromir Horacek after more than 10 years on duty as the Chair of the Czech National Committee will be changed from January 1, 2016 by newly elected Chair Jaroslav Zapomel (jaroslav.zapomel@vsb.cz). Deputy Chair from January 2015 is Jan Vimmr (jvimmr@kme.zcu.cz). MO nominated 5 delegates for the active participation of the Czech Republic at the IFToMM Congress 2015 and the IFToMM General Assembly held in October 2015 in Taipei. Miroslav Vaclavik (member of the Czech National Committee IFToMM) was awarded there by the IFToMM „Dedicated Service Award“.

2- CONFERENCE EVENTS

Organized under the auspices of the Czech National Committee IFToMM:

- 21. International Conference “Engineering Mechanics 2015” was held in Svratka from 11-14 May 2015 and organized by Institute of Theoretical and Applied Mechanics, Academy of Sciences of the Czech Republic, 205 participants presented 185 contributions from Biomechanics, Dynamics, Fluid Mechanics, Fracture Mechanics, History of Mechanics, Kinematics, Mechatronics, Reliability, Mechanics of Solids and Thermomechanics (the conference is organized every year).
- 31st International Conference “Computational Mechanics 2015” organized by the University of West Bohemia in Pilsen is held in Spicak from 9-11 November 2015, 92 participants (the conference is organized every year).
- “DYNAMESI 2015” - International Colloquium Dynamics of Machines and Mechanical Systems with Interactions, Prague, November, 2015, Institute of Thermomechanics, Academy of Sciences of the Czech Republic, (the conference is organized every year).

3- MOST RELEVANT PUBLICATIONS (no more than 10)

- Naprstek J., Fischer C. (eds.): Engineering Mechanics 2015, 21th International Conference, May 11-14, 2015, Svatka, Czech Republic, Institute of Theoretical and Applied Mechanics, Academy of Sciences of the Czech Republic, Prague 2015, 390 pages, ISBN 978-80-86246-42-0, ISSN 1805-8248.
- Zolotarev I., Pešek, L. (eds.) Dynamics of Machines and Mechanical Systems with Interactions, Proceedings DYMAMESI 2015, International Colloquium, November, 2015. Prague: Institute of Thermomechanics AS CR, v.v.i., 2015. 87 pages, ISBN 978-80-87012-57-4.

4- FUTURE PLANNED ACTIVITIES

Organizing the regular international conferences on topics from all field of Mechanics. In addition to the conferences listed above the XII. International Conference on the Theory of Machines and Mechanisms TMM 2016, September 6-8, 2016, Liberec, Czech Republic will be organized. This conference is organized regularly every four year under the auspices of the Czech National Committee IFToMM.

MO FINLAND

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REPORT OF ACTIVITY: from January 1 to November 30, 2015

1- DISCUSSION OF RECENT ACTIVITIES

IFToMM Finland organized a meeting event in August 2015 at Aalto University in Finland. During the meeting, representatives from Oulu University, the Lappeenranta University of Technology, the Tampere University of Technology, and Aalto University discussed national cooperation and future IFToMM Finland activities.

2- MEETINGS AND VISITS

Secretary (Prof. Jussi Sopenen) and two members of IFToMM Finland (Dr. Janne Heikkinen and Mr. Charles Nutakor) participated in the 2015 IFToMM world Congress as Finnish representatives.

3-RESEARCH COLLABORATION AND EXCHANGES

During the August 2015 meeting event, members of IFToMM Finland visited Tallinn University of Technology (TTU) to better acquaint themselves with research activities at TTU.

4- FUTURE PLANNED ACTIVITIES

IFToMM Finland will organize a meeting event in May 2016. The event will take a place in Oulu and will include visits to industrial companies in and around the Oulu region.

MO FRANCE

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REPORT OF ACTIVITY: 2015

1- DISCUSSION OF RECENT ACTIVITIES

In the year 2015, the French MO organized the fourth edition of the IFTOIM international symposium on robotics and mechatronics (ISRM 2015) in Futuroscope-Poitiers, France. The website including the flyer and the final technical program of the conference is : <http://isrm2015.sciencesconf.org/>

It was a successful event with large industry participants in the “technical day” event. This also set an example and also a format for future ISRM by bringing academia and industry in a closer tie through relevant research and projects.



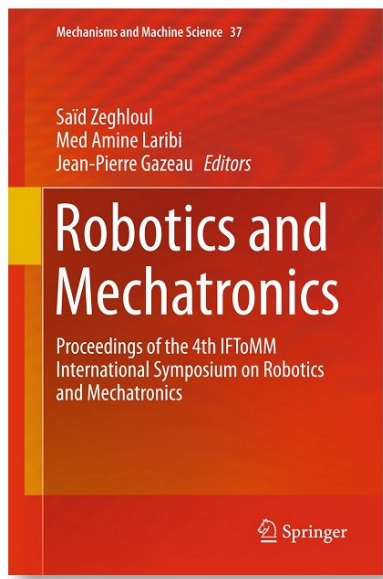
Figure 1: The photo taken at the ISRM 2015

Data about the ISRM 2015:

- Submissions : 40, accepted: 31, sessions : 7
- Attendees : 100 from 13 MOs
- Book proceedings
- Technical day “open and collaborative robotics”

2- MOST RELEVANT PUBLICATIONS

The book proceedings of the 4th IFToMM International Symposium on Robotics and Mechatronics. This volume contains papers that have been selected after review for oral presentation at ISRM 2015.



Zegloul, Saïd, Laribi, Med Amine, Gazeau, Jean-Pierre (Eds.); *Robotics and Mechatronics*. Springer International Publishing, 2015, Series Title: Mechanisms and Machine Science, Series Volume: 37 Number of Pages: 322.

MO GEORGIA

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REPORT OF ACTIVITY: from August 2014 to August 2015

1- DISCUSSION OF RECENT ACTIVITIES

Discussions on development of theory of machines and mechanisms in Georgia was held at 10 October 2014. Were considered problems of sciences of machines and mechanisms and role of Georgian scholars in its solution. At November of 2014 was held the meeting of leading scientists from Georgian Technical University, Georgian Aviation University, Institute of Machines Mechanics and other organizations and implementation of relevant measurements in the field of sciences of machines and mechanisms

2- MEETINGS AND VISITS

The Georgian Committee of IFToMM International Federation organize at 22 September 2014 in Tbilisi city the meeting of researchers of EU grant project BSERANET-007 (RELIABILITY AND DURABILITY OF MACHINES AND MECHANISMS USED FOR OIL AND GAS TRANSPORTATION IN BLACK SEA REGION) member countries – Germany, Turkey, Azerbaijan, Georgia. The many significant problems of sciences of machines and mechanisms that are related to execution of this project were considered.

3- RESEARCH COLLABORATION AND EXCHANGES

The Georgian Committee of IFToMM International Federation has close collaboration with scientists from Germany, Turkey, Belarus, Poland, Azerbaijan and other countries. The joint researches in various directions of sciences of machines and mechanisms are conducting.

4- CONFERENCE EVENTS

The Georgian Committee of IFToMM and Georgian Technical University, Institute of Machines Mechanics and Georgian Academy of Engineering were planning to held the International Scientific Conference “Mechanics 2016”. In the conference are participating the scientists from Russia, Germany, Italy, Poland, Kazakhstan, Azerbaijan and Georgia.

5- MOST RELEVANT PUBLICATIONS (no more than 10)

The publication format is following:

1. Nodar Davitashvili; *Practical collected studies in robots and robot-technical systems*. Tbilisi: Bartoni, 2015, -204 p. (In Georgian).

In report period by Georgian Committee of IFToMM was published four Journals “Problems of Mechanics” № 3(56)/2014, 4(57)/2014, 1(58)/2015 and 2(59)/2015.

For publication in the issue № 3(56)/2014 of the Journal there were submitted 15 papers, from which 10 papers were evaluated positively. They were published in this issue.

In the works are considered Newsletter of IFToMM; [Research of kinematic and dynamic errors of crank-piston mechanism](#); [Method of physical modeling of tractor units operation on slope](#); [Generation of usable energy in the diffuser at flow of gas with high thermal conductivity](#); [Impact of the main engine type on the energy efficiency operational indicator of the selected types of polish fishing cutters](#); [Analyses of emitted and transferred at cutting process into the cutting tool plate heat by finite elements method](#); [Assessment criteria for ignition properties of diesel engine fuels](#); [Methods of structure fracture research and analysis of reasons](#); [Numerical study of mode of deformation of single-mesh shell's models](#); [Operational methods for the energy efficiency management of the polish fishing fleet](#); [Application of calcs-technology methods at creation of construction technical expertise information systems \(IS\)](#).

For publication in the issue № 4(57)/2014 of the Journal there were submitted 13 papers, from which 8 papers were evaluated positively. They were published in this issue.

In the works are considered [Dynamic research of crank-piston mechanisms wiclearances in kinematic pairs and elasticity of links with concentrated masses](#); [Mechanics of actuators based on magnetic hybrid materials with applications for robotics, fluid control and sensor technology](#); [New constructions of lightweight deployable reflectors](#); [Stability of rubber edge of tea-plucking machine finger at collision with a tea sprout](#); [Conflict classical mechanics laws at rotation and theoretical issues of gravitational engine work](#); etc.

For publication in the issue № 1(58)/2015 of the Journal there were submitted 18 papers, from which 13 papers were evaluated positively. They were published in this issue.

In the works are considered [Analysis of spherical five-bar hinged manipulator with two degrees of freedom and dwells of output link](#); [Method of determination of strength of blow at radial forging of axis symmetric billets](#); [Modeling the dynamics of electromechanical automated drive system of towing winch](#); [Diagnosis of all-wheel-drive car transmission durability by way of rational choice of coupling damper parameters](#); [Material and energy-emissions assessment model of passenger car production stage](#); [organizational and technological basics of logistic operations execution](#); [On one characteristic problem for an equation of nonlinear oscillations problem](#); [The efficiency of alternative fuels application on motor transport](#); [integral method for evaluation and prediction of tornado](#); [Determination of critical loading at mode of deformation of having rectangle cut structure](#); etc.

For publication in the issue № 2(59)/2015 of the Journal there were submitted 14 papers, from which 9 papers were evaluated positively. They were published in this issue.

In the works are considered [Synthesis of hinged five-bar mechanism with two degrees of freedom destined for food industry](#); [New property of a closed-chain cone system with V-folding rods](#); [Soil crushing theory by impact working bodies](#); [analysis of dual channel piezoelectric accelerometer](#); [Analysis of new design of a transformable mechanical conical system with V-folding rods](#); [The impact of blank and cutting tool properties instability on character and intensity of wear](#); [Solution of turbulence problem based on tensor analysis](#); etc.

6- FUTURE PLANNED ACTIVITIES

The Georgian Committee of IFToMM is planning to hold at June 2016 International Scientific Conference “Mechanics 2016”

MO GERMANY

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REPORT OF ACTIVITY: from May 014 to December 2015

1- DISCUSSION OF RECENT ACTIVITIES

During the report period, the members of MO Germany have been very active in the IFToMM TCs and IFToMM's conferences. In particular, intensified activities are reported for the PCs Communications, Publications and Archiving, Education, and History of History of Mechanism and Machine Science, as well as the TCs Terminology, Computational Kinematics, Gearing and Transmissions, Linkages and Mechanical Controls, Micromachines, Multibody Dynamics, and Rotor Dynamics.

2- MEETINGS AND VISITS

Already since 2002, the IFToMM group Germany meets annually in a one-day event to discuss IFToMM-related matters such as IFToMM conferences and workshops but also commission and committee meetings.

A list of the members of IFToMM Group Germany can be found in **Annex A** to this report.

In 2015, the meeting was organized by Prof. dr. ir. Daniel Rixen, Institute of Applied Mechanics, Technical University of Munich, on April 17. Prof. Rixen is a member of the TC for Vibrations, and is a leading scientist in the areas of vibrations and multibody-structure coupling.

German members of most of the TCs and PCs have actively taken part in the activities of the TCs and PCs conference events and meetings.

3- RESEARCH COLLABORATION AND EXCHANGES

3.1 The national project DMG-lib about the preservation of knowledge and material in mechanism and machine science has been successfully extended to a European project with university partners from Italy, Spain, Romania, France and Germany where the individuals engaged in this project are all active within IFToMM especially PC History of TMM, PC Terminology, TC Computational Kinematics, TC Mechanical Transmission.

3.2 The MO Germany member Prof. Schiehlen is very active in the Benchmark group of the TC Multibody Dynamics, which is progressing very well.

3.3 Starting from 2015, the IFToMM Member Organizations Austria, Germany and Switzerland have intensified cooperation, and the annual meeting of the IFToMM MO Germany has been extended to participants from Austria and Switzerland.

4- CONFERENCE EVENTS

Conferences organized or co-organized by members of the MO Germany in the report period are:

4.1 The Second International Conference on Cable-Driven Parallel Robots (CableCon 2014) on August 24-27 2014, in Duisburg, Germany was quite successful with 60.

4.2 The 11th Kolloquium Getriebetechnik (Colloquium on Mechanisms) was carried out under the umbrella of IFToMM on September 28-30, 2015, at the Institute of Micro Technology and Medical Device Technology (MIMED) of Prof. Lueth at the Technical University of Munich. also this conference was very successful bringing a broad spectrum of applications of mechanisms under one roof.

4.3 A further conference organized by MO Germany is the third Conference on Mechanisms, Transmissions and Applications (MeTrApp) in Aachen, Germany, May 6-8, 2015 under the chair of Prof. Corves, which attracted more than 50 participants and whose proceedings will be published in the Springer Series Mechanisms and Machines Series.

4.4 Starting from 2015, the IFToMM Member Organizations Austria, Germany and Switzerland have started a native-language conference series called

“IFToMM D-A-CH Workshop”, where young researchers from German-speaking countries come together to exchange experiences and open issues about their PhD work. The First IFToMM D-A-CH took place on March 11, 2015, at the TU Dortmund as an add-on to the VDI-Conference Mechatronics (VDI is the German Association of Engineers). The conference was very successful with around 25 participants.

4.5 A IUTAM Symposium on Analytical Methods in Nonlinear Dynamics was organized in Darmstadt.

5- MOST RELEVANT PUBLICATIONS

- 5.1 Proceedings of the 2nd International Conference on Cable-Driven Parallel Robots (CableCon 2014).
 - 5.2 Proceedings of the 11th Kolloquium Getriebetechnik.
 - 5.3 Proceedings of the 3rd Conference on Mechanisms, Transmissions and Applications (MeTrApp).
 - 5.4 Proceedings of the 1st IFToMM D-A-CH Conference.
- All other relevant publications by German MO members have been published in the corresponding IFToMM conference proceedings books and relevant journals.

6- FUTURE PLANNED ACTIVITIES

The members of MO Germany are planning as organizers or co-organizers the following future conferences:

- 6.1 The 4th Conference on Microactuators and Micromechanisms MAMM-2016 will be held on October 05-07, 2016 at the Technical University of Ilmenau.
- 6.2 A Second IFToMM Symposium on Education of MMS is planned to take place in Germany.
- 6.3 The Third CableCon of the series initiated in Stuttgart and then in Duisburg will take place in 2017 in Quebec City (Chair: Prof. Gosselin).

MO HUNGARY

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REPORT OF ACTIVITY: from January 1, 2015 to December 12, 2015.

1- DISCUSSION OF RECENT ACTIVITIES

In 2015 the IFToMM fee had been paid by the HUNGARIAN ACADEMY of SCIENCES (HAS), (as each year since 1969). The activity of the Hungarian MO is carried out in the frame of the Committee for The Scientific Machine Design and its Subcommittee for Mechanism and Machine Theory.

2- MEETINGS AND VISITS

The Academic Committee and Subcommittee organize 3 – 4 Scientific Meetings yearly, usually at the Budapest University of Technology and Economics. The last Scientific Meeting of the HAS Committee had been held at

the Atomic Power Plant in Paks.

3- RESEARCH COLLABORATION AND EXCHANGES

The HAS Subcommittee has co – operation with the Hungarian Scientific Society for Mechanical Engineering. By means of this co – operation, the Subcommittee get contact with the Industry, involved in the field of MMS. The list of point 5.1-5.10 gives evidence for the wide-ranging collaboration on the research activity. At the other hand, the membership in an IFToMM TC offer possibility for exchange ideas on international level.

4- CONFERENCE EVENTS

There was not any in 2015 organized by the Hungarian MO.

5- MOST RELEVANT PUBLICATIONS

1. G. Habib, G. Rega, G. Stepan: Stability analysis of a two degrees-of-freedom mechanical system subject to proportional-derivative digital position control. *Journal of Vibration and Control* 2015 20(8) 1539-1555.
 2. J. Milton, T. Insperger, G. Stepan: Human Balance Control Dead Zones, Intermittency, and Micro-chaos. *Mathematical Approaches to Biological Systems* 2015 1-28.
 3. T. Insperger, J. Milton, G. Stepan: Semi-discretization for time-delayed neural balance control. *SIAM Journal on Applied Dynamic Systems* 2015 14(3) 1258-1277.
 4. M. Ghil, M.D. Chekroun, G. Stepan: A Collection on “Climate dynamics multiple scales and memory effects”. *Proceedings of the Royal Society of London A. Mathematical, Physical and ...* 2015.
 5. D. Bachrathy, A. Kossa, G. Stepan: Modelling process damping via FEM based Force-FRF. *University of British Columbia* 2015.
 6. G. Habib, A. Miklós, E.T. Enikov, G. Stepan, G. Rega: Nonlinear model-based parameter estimation and stability analysis of an aero-pendulum subject to digital delayed control. *International Journal of Dynamic and control* 2015 1-15
 7. B. Varszegi, D. Takács, G. Stepan: Position control of Rolling Scatcard IFAC-PaperOnLine 2015 48(12) 286-291.
 8. D. Hajdu, T. Insperger, G. Stepan: Sensitivity of stability charts with respect to modal parameter uncertainties for turning operations IFAC-PaperOnLine 2015 48(12) 63-68.
 9. T. Insperger, J. Milton, G. Stepan: Semi-dicretization and the time-delay PDA feedback control of human balance IFAC-PaperOnLine 2015 48(12) 93-98.
 10. Q. Xu, G. Stepan, Z. Wang: Balancing a wheeled inverted pendulum with a single accelerometer in the presence of time delay *Journal of Vibration and Control* 2015 1077546315583400.
- Professor Dr Vilmos Simon presented 2 lectures on the IFToMM Congress 2015, and he was the Winner of the “Best Paper Award”.

6- FUTURE PLANNED ACTIVITIES

The Hungarian IFToMM MO would continue its regular activity. The HAS Committee and Subcommittee are

promising platforms to the scientists, researchers, and experts for academic research and realizations on mechanics and engineering.

7- OTHER RELEVANT INFORMATION

A distinguished feature of our time is the rapid development of science and technology. The duty of every IFToMM MO is to encourage the undergraduate, graduate and doctoral students to devote efforts on Mechanism and Machine Sciences.

MO INDIA

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REPORT OF ACTIVITY: from December 2014 to December 2015

1- MEETINGS AND VISITS

a) Brief Report of Indian delegation to 2015 IFToMM World Congress was held at Taipei, Taiwan, from Oct. 25-30, 2015

From India 7 members and 4 students participated. Out of 610 papers submitted to the congress, 19 papers were submitted from India. The countries with submissions more than India were China-160, Taiwan-127, Japan-34, Romania-28, Russia-26, Germany-24, and Italy -22. Finally 14 papers were presented from India out of total 522 presentations. Prof. Ashitava Ghosal, Vice President, AMM (MO India) was elected as IFToMM Executive Council Member for the period 2016-2019. Participants from India

1. J. S. Rao, Kumaraguru College of Technology, India
 2. Ashitava Ghosal, Indian Institute of Science, Bangalore, India
 3. Subir K. Saha, Indian Institute of Technology Delhi, India
 4. Pushparaj Mani Pathak, Indian Institute of Technology Roorkee, India
 5. Anirban Guha, Indian Institute of Technology Bombay, India
 6. Sandipan Bandyopadhyay, Indian Institute of Technology Madras, India
 7. Rajeevlochana G. Chittawadigi, Amrita Vishwa Vidyapeetham, India
 8. K. P. Ashwin, Indian Institute of Science, India (student)
 9. Rama Krishna K, Indian Institute of Science, India (student)
 10. Midhun S Menon, Indian Institute of Science, India (student)
- b) The GBM of AMM (MO) will be held on 16th Dec 2015 at IIT Kanpur.

2- CONFERENCE EVENTS

The Department of Mechanical Engineering, IIT Kanpur, under the aegis of the Association for Machines and

Mechanisms (AMM), and International Federation for the Promotion of Mechanism and Machine Science (IFToMM) is delighted to host the 2nd International and 17th National Conference on Machines and Mechanisms (iNaCoMM 2015). The convention will be held on campus during December 16th- 19th, 2015. More information about the conference is available from website <http://www.iitk.ac.in/inacomm15/>.

3- FUTURE PLANNED ACTIVITIES

Department of mechanical engineering, VNIT Nagpur, INDIA will be organizing the 12th IPRoMM (INDUSTRIAL PROBLEMS ON MACHINES & MECHANISMS) in December 2016 under the aegis of AMM (MO India). IPRoMM essentially concentrates on industrial problems and practical solutions to the design of machines in specific areas. The workshops held so far have covered textile, mechanical handling agricultural machinery and home appliances. The forthcoming event will focus on “Challenges in Manufacturing”.

4- RELEVANT PHOTOGRAPHS, FLYERS

Indian Delegation to IFToMM Congress held at Taipei.



The above information will be used in IFToMM Newsletter, and will be posted in the IFToMM webpage

MO ISRAEL

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REPORT OF ACTIVITY: from January 2015 to December 2015

1- MEETINGS AND VISITS

Key note lecture in RSS 2015 in Rome

2- RESEARCH COLLABORATION AND EXCHANGES

Research Collaboration with Politechnique de Milano, Milano

3- CONFERENCE EVENTS

Participation in IFToMM General Assembly in Taiwan

4- MOST RELEVANT PUBLICATIONS (no more than 10)

1. Cohen, A., Shoham, M. :”Application of Hyper-Dual Numbers to Multi-Body Kinematics,” IEEE Journal of Mechanisms and Robotics, Vol. 8, No. 1, 2015.
2. Ziso, H., Shoham, M. :”Bending Instability of a General Cross-Section Thin-Wall Tube for Minimal Radius of Curvature Passage,” ASME Journal of Applied Mechanics, Vol. 81, No.10, 2014.
3. aria, C., Sadowsky, O., Bicho, E., Ferrigno, G., Joskowicz, L., Shoham, M., Vivanti, R., De Momi, E. :”Validation of a stereo camera system to quantify brain deformation due to breathing and pulsatility,” Medical Physics, Vol. 41, 2014.
4. Ziso, H., Or, Y., Shoham, M. :” Numerical Model of Magnetic Bead Chain for Minimal Radius of Curvature Passage Based on Linear Programming,” IFToMM World Congress, 2015.

5- FUTURE PLANNED ACTIVITIES

5-th Israel Conference on Robotics planned for 13-14 April 2016.

16th Israel Symposium on medical imaging and medical robotics – April 13-14 2016.

6- RELEVANT PHOTOGRAPHS, FLYERS

<http://www.ariel.ac.il/sites/shiller/icr2016/>



Welcome

ICR2016 is the 5th Israeli Conference on Robotics, organized and sponsored by the Israeli Robotics Association. It is the leading robotics conference and exhibition in Israel, intended to provide a forum for Israeli and foreign researchers and engineers from industry and academia. ICR is also intended to encourage local and international collaborations, and strengthen Israel's position as a world leader in high-end robotics.

Specific goals of ICR2016 are to promote innovation and support entrepreneurship in the robotics field, to promote robotics education and encourage the use of robotics and automation in the traditional industries, in agriculture, and in assisting the elderly population.

ICR2016 will host **ISRAELI 2016**, the 16th Israeli Symposium on Computer Aided Surgery, Medical Robotics, and Medical Imaging.

The scientific program will include plenary talks, panel discussions, an entrepreneurs forum, and presentation of contributed and invited papers in several technical tracks.

The scope of the conference covers topics that range from theoretical developments in industrial applications and emphasize current interests of the local robotics community and perceived needs of the Israeli industry and economy.

Topics include, but are not limited to:

- Service robots
- Medical robots
- Autonomous vehicles
- Robotics Education
- Robots in agriculture
- Security and defense applications
- Microbots
- Bio-logically inspired systems
- Multi-robot systems
- Automated manufacturing
- Navigation and motion planning
- Perception
- Localization and mapping
- Machine Vision
- Robot Dynamics and control
- Robot design

MO ITALY

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REPORT OF ACTIVITY: from January 1, 2015 to December 12, 2015

1- DISCUSSION OF RECENT ACTIVITIES

- The web page of IFToMM Italy was established; in it the most relevant planned activities and news are reported both in Italian and English
- Some modifications were planned in the Association statute.

- Wide participation of IFToMM Italy to the IFToMM 2015 World Congress, Oct. 25-30, Taipei, Taiwan; about 30 papers authored or co-authored by IFToMM Italy members were submitted .

2- MEETINGS AND VISITS

- Six meetings of the administration staff were taken planning future activities.
- The general assembly will be on December 11 in Naples

3- RESEARCH COLLABORATION AND EXCHANGES

- Some research and teaching agreements were established with foreign Universities

4- CONFERENCE EVENTS

- Planned conferences for 2016; see section 6

5- MOST RELEVANT PUBLICATIONS

1. Ceccarelli M., A short account of History of IFToMM and its role in MMS, Mechanism and Machine Theory, Vol. 89, 2015, pp.75-91, 10.1016/j.mechmachtheory.2014.09.007
2. Pennacchi P., Borghesani P., Chatterton S., "A cyclostationary multi-domain analysis of fluid instability in Kaplan turbines", Mechanical systems and signal processing", 2015, vol. 60-61, pagg. 375-390.
3. S. Delvecchio, G. D'Elia, G. Dalpiaz (2015). On the use of cyclostationary indicators in IC engine quality control by cold tests, Mechanical Systems and Signal Processing, Vol. 60–61, (August 2015), pp. 208–228, DOI: 10.1016/j.ymssp.2014.09.015
4. Francesco Sorce, Giuseppe Genchi (Eds.), Essays on the History of Mechanical Engineering, Springer International Publishing Switzerland, e-book ISBN: 978-3-319-22679-8, Hardcover ISBN: 978-3-319-22679-8, doi: 10.1007/978-3-319-22680-4
5. A. Masoumi, F. Pellicano, F. S. Samani, M. Barbieri, Symmetry breaking and chaos induced imbalance in planetary gears, Nonlinear Dynamics 80 (2015) 561-582 ISSN 0924-090X , DOI 10.1007/s11071-014-1890-3.
6. M. Verotti; R. Crescenzi; M. Balucani; N. P. Belfiore, MEMS-Based Conjugate Surfaces Flexure Hinge, ASME Journal Mechanical Design. 2015; 137(1):012301-012301-10. MD-14-1242 doi: 10.1115/1.4028791
7. A. Cammarata · R. Sinatra, Parametric Study for the Steady-State Equilibrium of a Towfish, J Intell Robot Syst. DOI 10.1007/s10846-015-0246-7, 30 June 2015.
8. Cheli F., Melzi S., Sabbioni E., Vignati M., “Comparison of torque vectoring control strategies for a IWM vehicle”, SAE INTERNATIONAL JOURNAL OF PASSENGER CARS. ELECTRONIC AND ELECTRICAL SYSTEMS, 2014, vol. 7, p. 1-9, ISSN: 1946-4614, doi: 10.4271/2014-01-0860
9. Martini, A., Troncossi, M., Carricato, M., and Rivola, A. 2015. Static balancing of a parallel kinematics machine with Linear-Delta architecture: theory, design and numerical investigation. Mechanism and Machine Theory, 90, pp. 128-141.

10. Treviso, A.; Mundo, D.; Tournour, M; A C0-continuous RZT beam element for the damped response of laminated structures, *Composite Structures*, 131, pp. 987-994, 2015, DOI: 10.1016/j.compstruct.2015.06.049

6- FUTURE PLANNED ACTIVITIES

- RAAD 2017 in Turin : <http://www.polito.it/RAAD2017>
- TCLMC Summer School on Mechanism Design for Applications MDA 2016: http://www.iftommitaly.it/wp-content/uploads/2014/10/Summer-School_MDA2016_flyer-16July2015.pdf

7- OTHER RELEVANT INFORMATION

- The International Journal of Mechanics and Control www.jomac.it is from 2015 the reference journal of IFToMM Italy

8- RELEVANT PHOTOGRAPHS, FLYERS

See web pages in section 6 : Summer School Flyer and RAAD 2017 flyer

MO JAPAN

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1- DISCUSSION OF RECENT ACTIVITIES

We had an annual symposium / meeting on Saturday July 18, 2014. The symposium included 11 academic presentations. We encouraged young researchers by awarding good presentations. The finalist awards were given to Mr. Hitoshi AOKI, Graduate School of Tokyo Tech. for his paper titled "Design, Development and Generative Force Measurement of a 3D Magnetic Tweezer System Having Pole Positioning Mechanism", and to Mr. Keisuke ARITA, Graduate School of Tokyo Tech. for his paper titled "Small Mechanical Valve with High Flow Rate for Simultaneous Control of Multiple Flow Channels and Its Experiment" and to Mr. Yusuke MIZUNO, Graduate School of Tokyo Tech. for his paper titled "A Study on the Sidebands of Tooth Mesh Frequency Results of Planetary Gear System's Vibration". The best paper award was given to Mr. Takuya OTANI, Graduate School of Waseda Univ. for his paper titled "Research on Biped Running Robot Utilizing Pelvic Movement - 9th Report: Running in Sagittal Plane with One Leg of Lower-body Robot That Mimics Human Joint Stiffness -"

We also sponsored several seminars given by researchers from abroad. Unfortunately, we could not organize a technical visit to a firm. We participated the General Assembly of fourteenth World Congress as a member organization and issued the strong willingness of holding the future World Congress in Japan.

2- MEETINGS AND VISITS

General annual meeting was held on the same day as the

annual symposium as described above. The meeting consisted of about 40 attendee and summarized the one year activities.

3- OTHER RELEVANT INFORMATION

We will hold several "mini symposium" in the occasion of having foreign researchers in Japan, that will encourage the international friendship and research cooperation. Also we will co-sponsor future several international conferences planned in Japan.

4- RELEVANT PHOTOGRAPHS, FLYERS



Group photo of the four finalists with the chair and vice

MO KAZAKHSTAN

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REPORT OF ACTIVITY: from January 1, 2015 to November 26, 2015

1- DISCUSSION OF RECENT ACTIVITIES

Four research projects have been implemented in the reported period supported by the grants of the State Science Committee of Kazakhstan: «Development of mathematical models of anti-vibration devices with non-holonomic constraints realized by rolling bearings in case of resistance to rolling on relaxing soil»; «Development of methods for the study of stationary oscillations of the rotor with imbalanced mass and skewed disk»; Developing of adaptive drive of manipulator; Development of energy research methods of nonlinear time-dependent thermo-mechanical processes in the rod structural elements.

Members of IFToMM MO Kazakhstan in 2015 were participated in conferences: VI International conference "ISSUES IN MODERN MACHINES MECHANICS" Russia, Ulan-Ude, Baikal, 29 June - 4 July 2015 (reporters are prof. A. Jomartov, prof. B. Tultayev) ; Republican Summer School 2015, Bishkek city, Kyrgyzstan, 7-9 July (reporter is prof. A. Jomartov); 2015 IFToMM World Congress, Oct. 25-30, 2015, Taipei, Taiwan (reporters are prof. A. Jomartov, prof. Z. Iskakov, prof. Z. Baigunchekov). In 2015, members of the IFToMM MO Kazakhstan were conducted the workshops on the theory of mechanisms and machines, for young scientists and students in the cities of Astana, Almaty, Shymkent.

In 2015, members of the IFToMM MO Kazakhstan participated to the following technical committees: Technical Committee for Multi-body Dynamics - Prof. Assylbek JOMARTOV; Technical Committee for Gearing and Transmissions - Prof. Konstantin IVANOV.

2- FUTURE PLANNED ACTIVITIES

Promote co-sponsored events by IFToMM, increase the participation of Kazakhstan members on activities promoted by IFToMM.

IFToMM MO Kazakhstan plans to actively participate in the work of the technical committees IFToMM and increase the number of publications in IFToMM journals.

3- RELEVANT PHOTOGRAPHS, FLYERS



Prof. A. Mozgunova, Prof. B. Tultayev in VI International conference "ISSUES IN MODERN MACHINES MECHANICS" Russia, Ulan-Ude, Baikal, 29 June - 4 July 2015.



Prof. Temirbekov, prof. A. Jomartov, prof. Yu. Drakunov, prof. M. Utenov, in Republican Summer School 2015, Bishkek city, Kyrgyzstan



A short scientific internship of trainee researcher of "Institute of Mechanics and Mechanical Engineering after Academician U.A. Dzholdasbekov" Mr. Gani Balbayev at LARM, the Laboratory of Robotics and Mechatronics at University of Cassino, Italy from 1 to 31 July 2015 by working on topics related to "Developing of an adaptive drive of manipulators".



Prof. A. Jomartov in 2015 IFToMM General Assembly, Taipei, Taiwan



Prof. A. Jomartov, prof. Z. Iskakov in 2015 IFToMM World Congress, Oct. 25-30, 2015, Taipei, Taiwan

MO LITHUANIA

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MO Webpage: www.ktu.edu

REPORT OF ACTIVITY: from January 1, 2015 to December 5, 2015

1- DISCUSSION OF RECENT ACTIVITIES

The project of “Santaka Valley” in Kaunas was initiated by the researchers in Mechatronics. Mechatronics is one of four research priorities of this Valley.



“Santaka Valley” in Kaunas

2- MEETINGS AND VISITS

Lithuanian IFToMM specialists are involved in “HealTech” European Teaming project, co-ordinated by Lund university (Sweden) and VTT (Finland)

3- RESEARCH COLLABORATION AND EXCHANGES

In the field of the high precision manufacturing IFToMM specialists collaborate with Fraunhofer IPT and Rennes (France) university

Framework FP7 project PiezoMAT and Eurostars project “MOINFO” are the best examples in which IFToMM specialists successfully collaborate with foreign partners.

4- CONFERENCE EVENTS

Traditional International conferences “Mechanika 2015” and “Transport Means 2015”.

4-1. 19th International Conference „TRANSPORT MEANS - 2015“

19th International conference Transport Means 2015 held in Kaunas and Klaipėda, Lithuania, on 22th – 23th October 2015.

It continues long tradition and reflects the most relevant scientific and practical problems of transport engineering. The conference aims to provide a platform for discussion, interactions and exchange between researchers, scientists and engineers.

Conference is organized by Kaunas University of Technology, IFToMM National Committee of Lithuania, SC “Lietuvos geležinkeliai” (Lithuanian railways), BESTFACT (Best Practice Factory for Freight Transport), Lithuanian Society of Automotive Engineers, The Division of Technical Sciences of Lithuanian Academy of Sciences, Klaipėda University, Vilnius Gediminas Technical University

Conference Topics: Intelligent Transport Systems; Infrastructure, Vehicles/Modes and Flows; Mobility, Safety, Economics; Sustainable Transport Solutions; Defence Technologies; Waterborne Transport.

Plenary session opened and chaired by Prof. Vytautas Ostasevičius, Chairman of IFToMM National Committee of Lithuania, Member of Lithuanian and Swedish Royal Engineering Academies of Sciences.



Prof. Vytautas Ostasevicius-opening speech

The presentation was followed by Marcel Hushebeck (PTV, Germany), Algirdas Šakalys (Vilnius Gediminas Technical University, Lithuania), Darius Bazaras (Vilnius Gediminas Technical University, Lithuania), Rima Mickevičienė (Klaipėda University, Lithuania), Vytautas Janilionis (DEMATIC Kaunas, affiliate of DEMATIC Limited, Lithuania), Algimantas Fedaravičius (Kaunas University of Technology, Lithuania).

The conference was attended by more than 200 participants from 21 Countries (UK, Hungary, Netherlands, Slovenia, Germany, India, Italy, USA, Sweden, Spain, France, Czech Republic, Slovak Republic, Latvia, Poland, Austria, Belgium, Switzerland, Finland, Ukraine, Lithuania). 87 papers were presented during the Plenary and Parallel Sessions.

The proceedings of the 19th International Conference Transport Means 2015 contain selected 170 papers.

4-2. 20th International Conference “Mechanika 2015”

International Conference “Mechanika-2015” is organized as one conference of the cycle “Science and Industry of Lithuania”. The conference “Mechanika-2015” took place on 23 – 24th of April at the Faculty of Mechanical Engineering and Design of Kaunas University of Technology. The Conference is organized by Kaunas University of Technology in cooperation with Lithuanian Academy of Science, IFToMM National Committee of Lithuania and the Baltic Association of Mechanical Engineering (BAME). The conference aims are to discuss current problems of research, education, and industry in the country; to present results of the most recent research in specific subject areas. Among its participants the leading specialists from the institutions of higher education and scientific institutes, authorities in technical sciences and other areas, and representatives of industry and business organizations were present. The Conference Committee selected 78 presentations from the 92 submitted and after the second selection 54 reports were published in the Proceedings of the 20th International

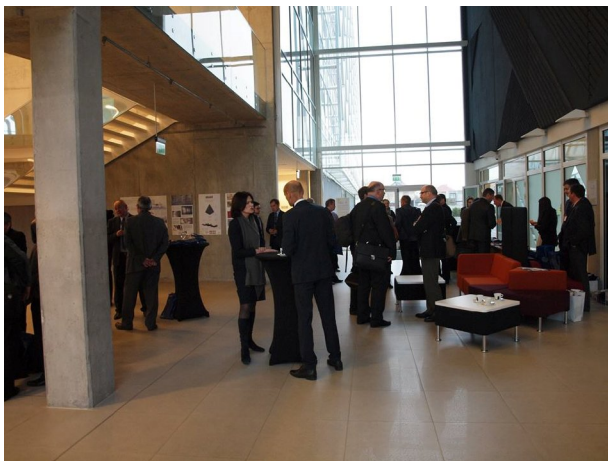
Conference “Mechanika”.

The conference proceedings cover the following topics:

- strength of materials and structural elements;
- mechanical technologies;
- dynamics of mechanical systems;
- technologies of graphics media and advanced materials.

Pictures below-moments of the conferences:





5- MOST RELEVANT PUBLICATIONS (no more than 10)

V.Ostasevicius et al. Cutting tool vibration energy harvesting for wireless sensors applications. *SENSORS AND ACTUATORS A-PHYSICAL* Vol. 233 Pages: 310-318 DOI: 10.1016/j.sna.2015.07.014; SEP 1 2015
V.Ostasevicius et al. Peculiarities of the Third Natural Frequency Vibrations of a Cantilever for the Improvement of Energy Harvesting. *SENSORS* Vol. 15 (6)Pages: 12594-12612 DOI: 10.3390/s150612594; JUN 2015
V.Ostasevicius et al. Self-powering wireless devices for cloud manufacturing applications. Int J Adv Manuf Technol. 2015, DOI: 10.1007/s00170-015-7617-x

6- FUTURE PLANNED ACTIVITIES

Int. Conf. “Mechanika-2016”, Int.Conf. “Transport means 2016”

MO POLAND

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1- MEETINGS AND VISITS

Attached to: Appendix REPORT ON THE TERM OF OFFICE OF THE COMMITTEE IFToMM POLAND period: 2012-2015

In the international conference TMiUM’2014 under patronage of the Committee IFToMM-Poland -the following foreign Participants took part: Prof. Marco Ceccarelli (IFToMM Executive Council Member), Prof. Corves Burghard (IFToMM Executive Council Member) and Prof. Erwin-Christian Lovasz (Chair of IFToMM TC). Prof. Marco Ceccarelli (IFToMM Executive Council Member) took part in the ceremony at the Warsaw TU (October 2015) of unveiling of the plate for commemoration Prof. Jan Oderfeld – the founder of IFToMM in Zakopane

in 1969 and the Polish outstanding researcher in the field of TMM.

Prof. Stanisław Zawislak took part in the conference MeTrApp'2015 in Aachen, Germany - organized under IFToMM patronage by Prof. Corves Burghard (IFToMM Executive Council Member), where several IFToMM officers took part e.g. Prof. Jorge Angeles (IFToMM Executive Council Member) and Prof. Andres Kecskemethy (Editor of MMT Journal).

2- CONFERENCE EVENTS

A ceremony took place at Hyrny in Zakopane, for unveiling a bronze Plaque, Fig. 1, commemorating the 40th anniversary of the foundation of IFToMM was founded on September 27, 1969. On this occasion the Polish Committee TMM received many congratulations among others from the Minister of Science and Higher Education Prof. Barbara Kudrycka

3- MOST RELEVANT PUBLICATIONS (no more than 10)

Yang L., Chew C.M., Poo A.N., Zielinska T.: Real-time Bipedal Walking Adjustment Modes Based on a Trunkated Furies Series Model. Int. Journal on Humanoid Robotics (IJHR), World Scientific, vol.7, issue 1, pp.95-126, 2010
Wojnarowski J.: "The Significance and Role Of IFToMM Poland in the Creative Development of Mechanism and Machine Science" (s. 367 - 382) w Ed. M. Ceccarelli Technology Developments: the Role of Mechanism and Machine Science and IFToMM", Springer 2011
Introduction to Mechatronics [in Polish], PWSZ Nowy Sacz .2012 pp.

Zawislak S., Drewniak J., Kopec J.: Kinematics and dynamics of compound and complex gear system, MeTrApp Proceedings, Springer, Cham/Heidelberg, 2015, pp. 197-2007

Uhl T., Lubieniecki M.: Integration of thermal energy harvesting in semi-active piezoelectric shunt-damping systems, Journal of Electronic Materials. 2015 vol. 44 no. 1, s. 341-347

Orzechowski G., Fraćzek J.: Nearly Incompressible Nonlinear Material Models in the Large Deformation Analysis of Beams Using ANCF, w: Nonlinear Dynamics, 2015, pp. 1-14

Olinski M., B. Lewandowski B., Gronowicz A.: The Evolution of Devices and Systems Supporting Rehabilitation of Lower Limbs. *International Journal of Applied Mechanics and Engineering* 20.1 (2015), 147-158
Wojnarowski J. : Influence of Copernicus idea on the development of mechanisms of machines. Int. J. of Applied Mechanics and Engineering 2014. Vol. 19, No 3. pp.I-IV.
Wojnarowski J. : Influence of Copernicus idea on the development of mechanisms of machines. XXIV Konferencja Naukowo Dydaktyczna TMM, Szklarska Poręba 22-26. 09. 2014.

4- FUTURE PLANNED ACTIVITIES

IFToMM-Poland organizes 2 plenary meetings per year in different Universities or Institutes. Every meeting has two or three parts including e.g. session of scientific talks and

visit in university laboratories. Sometimes, IFToMM officers are invited for such a meeting e.g. from neighbor countries (Lithuania, Germany).

Every two years, international conference on TMM is organized (Polish abbreviation: TMiUM) e.g. in 2016 (Rytko near Cracov) and 2018. Usually, invited speaker are e.g.: IFToMM officers or famous professors from abroad. The 15th World IFToMM Congress will be organized in Poland i.e. Cracov (and Zakopane) in June/July 2019. The preparations are ongoing.

5- RELEVANT PHOTOGRAPHS, FLYERS



CONGRATULATION TO PROF. MARCO CECCARELLI – THE Eight PRESIDENT OF IFToMM, Besançon, July 20th, 2007



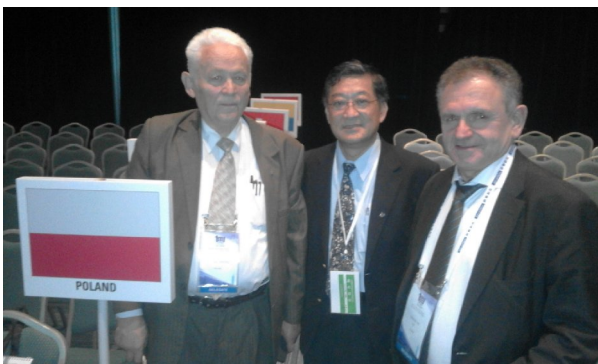
In the 95 anniversary of the birth of Prof. John Oderfeld



Professors K. Kluszczyński , J. Wojnarowski, J. Gawlik - in time meeting PC TMM. May 2015



Unveiled an table Nov. 21, 2015 in honor of Prof. Jan Oderfeld



Professors: J. Wojnarowski, Shuo Hung Chang, T. Uhl. Before General Assembly IFToMM 2015 Taipei,



Speech by Prof. J. Wojnarowski the occasion of the unveiling of a plaque in honor of Jan Oderfeld



The eighth meeting of the PC TMM in Warsaw Unveiled an table in honor of Prof. Jan Oderfeld Nov. 21, 2015

Appendix

<p>Address: Tel.: (32) 237 24 01 Tel. k. 601 502370 Email: jozef.wojnarowski@polsl.pl www.tmm.ath.bielsko.pl</p>	<p>POLSKI KOMITET TEORII MASZYN I MECHANIZMÓW Komitetu Budowy Maszyn Polskiej Akademii Nauk</p>	
	<p>Polish Committee of Theory of Machines and Mechanisms of the Committee of Machine Building of the Polish Academy of Science affiliated to IFToMM Committee IFToMM-Poland</p>	

REPORT ON THE TERM OF OFFICE OF THE COMMITTEE IFToMM POLAND Period: 2012-2015

1. Committee IFToMM-Poland (polish abbreviation: PK TMM, taken from Polish Committee of Theory of Machines and Mechanisms) has been acting as the Section of The Committee of Machine Building of The Polish Academy of Science (polish abbreviation: PAN). The name IFToMM-Poland will be used in what follows. According to the Constitution of PAN, the members of the Committee IFToMM-Poland are as follows:

- (a) Members of The Committee of Machine Building of The Polish Academy of Science (10 persons), who agreed for access this Section;
- (a) 70 Experts appointed by The Polish Academy of Science; upon the motion of the President of IFToMM-Poland – Professor Józef Wojnarowski.
- (b) *The Members of the Committee IFToMM-Poland take part in the activities of IFToMM federation at all its levels and all possible ranges. They regularly take parts in World Congresses of IFToMM – especially in the very last 14th Congress in Taipei, Taiwan which had been held on 25-30 November 2015.*
- (c) *Committee IFToMM-Poland had appointed the team of professors: Tadeusz Uhl, Teresa Zielińska and Józef Wojnarowski – responsible for an action aiming for organization of World Congress of IFToMM in Poland in 2019 in Cracow due to 50th anniversary of IFToMM. The Federation has been established on 27 September 1969 in Zakopane, Poland. The task of the Team was e.g. preparation of presentation for showing during the 14. IFToMM World Congress. The formal motion was also prepared and submitted to the General Assembly of IFToMM.*
- (d) *Prof. Józef Wojnarowski was a member of the Program Committee of the XIV World IFToMM Congress in Taipei, Taiwan.*
- (e) several members of Committee-IFToMM Poland are reviewers of famous journals dedicated to TMM especially - of the journal “Mechanism and Machine Theory” which is edited under Patronage of IFToMM.

During the term of office, three Members of the Committee IFToMM-Poland died:

- Professor Franciszek Siemieniako,
- Professor Bogdan Skalmierski,
- Professor Stanisław Trzaska.

May God Rest *their Souls in Peace!*

Management Board of Committee IFToMM-Poland (2012-2016)

- Chair: Prof. Józef Wojnarowski
- Vice-Chair: Prof. Antoni Gronowicz
- Members (professors): Iwona Adamiec-Wójcik, Wojciech Blajer, Tadeusz Uhl {Franciszek Siemieniako}
- Secretary: Assoc. Prof. Stanisław Zawisłak

National Committee for Co-operation with IFToMM (2012-2016)

- Chair: Prof. Józef Wojnarowski
- Members (professors): Jan Awrejcewicz, Czesław Cempel,
- Prof. Antoni Gronowicz, Prof. Janusz Kowal
- Secretary: Assoc. Prof. Stanisław Zawisłak.

2. According to the PAN regulations – the activity of Committee IFToMM-Poland consists e.g. in organizing of so called Plenary Meeting – usually 2 times per year.

The list of the meetings is as follows:

- No 1 - 2012/1- 18 May 2012 -Silesian University of Technology in Gliwice
- No 2 - 2012/2- 20 September 2012 - Hotel “Solny”, Kołobrzeg, TM&UM’2012
- No 3 - 2013/1- 10 May 2013 -Silesian University of Technology in Gliwice
- No 4 - 2013/2- 25 October 2013 -University of Technology in Wrocław
- No 5 - 2014/1- 9 May 2014 -AGH University of Technology in Cracow
- No 6 - 2014/2- 23 September 2014 - Hotel “Las” Piechowice, TM&UM’2014
- No 7 - 2015/1- 20-21 May 2015 -University of Applied Science in Nowy Sącz
- No 8 - 2015/2- 21 November 2015 -University of Technology in Warsaw

Two traditional international conferences were organized by the Committee IFToMM-Poland dedicated to mechanics of machines – named: Theory of Machines and Mechatronics – the abbreviation: TM&UM.

Two conferences were as follows (2012 and 2014):

23rd Conference in Kołobrzeg

Term: 19-21 September 2012, Place: Kołobrzeg (on Baltic seaside), edition no 23rd TMM&UM’2012. Chair of Scientific Committee: Prof. Józef Wojnarowski, Chair of Organizing Committee – Prof. Tadeusz Bil, University of Technology in Koszalin. Number of participants: approx. 70.

The papers were published in Polish scientific journals (of international meaning) Acta Mechanica et Automatica and International Journal of Applied Mechanics and Engineering(IJAME).

24th Conference in Szklarska Poręba

Term: 21-24 September 2014. Place: Szklarska Poręba, edition no 24th TM&UM’2014. Number of participant: 60. Number of talks: 69.

Foreign participants:

- Prof. Marco Ceccarelli - past IFToMM president, University of Cassino and South Latium, Italy
- Prof. Burghard Corves (Aachen Germany),
- Prof. Erwin- Cristian Lovasz (Romania) and
- Prof. Z. Iskakow (Kazakhstan):

The plenary talks:

- (i) prof. M. Ceccarelli (Italy) “.What can be innovation in MMS: achievements and community developments”
- (ii) prof. B. Corves (Aachen RFN) "A novel flexible and versatile robotic concept with optimized grasping process and reconfiguration"
- (iii) Prof. E.- C. Lovasz and other (Romania): "Novel solution for leg motion with 5-link belt mechanism"
- (iv) Prof. J. Wojnarowski: "Influence of Copernicus idea on the development of mechanisms of machines"

(v) Prof. Z. Iskakow (Kazachstan): "The nonlinear vibration of orthogonal mechanism of shaking table".
"Papers were published in: International Journal Applied Mechanics and Engineering University Press", Zielona Góra. /V.19 No. 3 2014/ as well as in Abstracts in : Modern trends in theory of machines and mechatronics systems, Wrocław Sept. 2014, p.134.

3. Short information on the consecutive Plenary Meetings:

Ad. no 1:

1. Host of the Meeting: Professor Jerzy Świder – Dean of the Faculty of Mechanical Engineering and Technology (Silesian University of Technology in Gliwice).
2. Prof. Józef Wojnarowski congratulated Prof. Teresa Zielińska for Her election for the post of Secretary General of Executive Council of IFToMM.
3. Discussion of the following matters:
 - authorities of the Committee and appointment of Experts,
 - Congress IFToMM in Poland,
 - Organization of the conference TMMiUM'2012,
 - *Information of Prof. Zbigniew Kęsy on the IFToMM Technical Committee on Reliability which He chairs.*

Ad no 2:

1. Meeting took place during the Conference TMMiUM'2012. Chair of the Organizing Committee - Prof. Tadeusz Bil (TU Koszalin).
2. Organizer of the next conference TMMiUM'2014 – chosen: TU Wrocław.
3. Discussion of the program and future activities of Committee IFToMM-Poland.
4. Matter Word IFToMM Congress 2019 – proposal of the venue: Cracow (Cracow-Zakopane) due to **50th anniversary of creation of the federation IFToMM in Zakopane in 1969.**

Ad no 3:

Jubilee of 80th birthday of Prof. Józef WOJNAROWSKI.

1. Host: Prof. Krzysztof Kluszczyński. Greetings of Prof. Józef Wojnarowski and His Wife – the special Guest.
2. Matters discussed: Congress of IFToMM, situation of higher education in Poland.
3. Congratulations for Celebrant.

Scientific part - talks:

- Dr Jarosław Domin „Hybrid pneumatic-electromagnetic launcher – building, modelling, control – /15 min./after talk – visit in laboratories.
- Prof. Krzysztof Kluszczyński „From electro-mechanics to mechatronics - 15 years of mechatronics at the Electric Faculty of Silesian TU” – /5 min./ – introduction to visit in laboratories of mechatronics.

Ad no 4:

1. Host: Prof. Antoni Gronowicz – Vice-chair of the Committee IFToMM-Poland, **Department of Theory of Machines and Mechatronics Systems (Chair)**, Institute of Machine Building and Usage (Vice-Chair for Science and Development of Young Scientists), Faculty of Mechanical Engineering of TU Wrocław.

2. Special Guest - Prof. Stefan Miller – Senior Scientific Worker on TMM from TU Wrocław.

3. Prof. Józef Wojnarowski gave a talk „History of the manuscript ‘DE REVOLUTIONIBUS’ by Nicolaus Copernicus”. At present, the manuscript is kept in the Jagiellonian Library in Cracow. For centuries it circulated around Europe, in 20 century it belonged to the Government of Czech Republic. They – in 60-ties (as Czechoslovakia) granted it to Poland.

4. Remarks on financing of scientific grants – talk Dr Damian Derlukiewicz.

Further scientific talks:

- Dr Jacek Bałchanowski: Parallel Mechanisms – topology, kinematics, particularities.
- Prof. Józef Wojnarowski: Reverse Tensor introduced by Stanisław Bodaszewski.

Ad no 5:

1. Host: Prof. Tadeusz Uhl – Chair of Robotics and Mechatronics, Faculty of Mechanical Engineering and Robotics, AGH TU University of Cracow.

2. Special Guest: Prof. Karol Tomaszewski – outstanding professor of TMM and robotics, worker of the AGH TU of Cracow.

3. Resolution of the Committee IFToMM-Poland on the initiative of Prof. Józef Wojnarowski, unanimously accepted by all participants:

Proposal of organization of the World IFToMM Congress in Cracow and Zakopane in 2019 in 50-anniversary of establishing of IFToMM. Team: (a) Prof. Tadeusz Uhl – Organizer of the Congress; (b) Prof. Józef Wojnarowski – Chair of Committee IFToMM-Poland and (c) Prof. Teresa Zielińska – member of Executive Council of IFToMM.

Scientific talks:

- Prof. Józef Wojnarowski: „Aortic valve – organ or mechanism”,
- Prof. Tadeusz Uhl: „Design and prototyping of robots as well as the range of scientific works performed at present at the Department of Robotics and Mechatronics”.

Ad no 6:

Conference of TMMiUM'2014.

Special Guest: Prof. Marco Ceccarelli – University of Casino, Italy – Member of IFToMM Executive Council.

1. Host: Prof. Antoni Gronowicz – Chair of the Chair of Biomedical Engineering, Mechatronics and Mechanism Theory at the Faculty of Mechanical Engineering, TU Wrocław.
2. To commemorate the life of Prof. Franciszek Siemieniako of TU Białystok, Dr Roman Trochimeczuk presented His life and achievements.
3. Prof. Antoni Gronowicz: On programs of TMM at Polish Universities.

Ad no 7:

Special Guest: Prof. Józef Gawlik – TU Cracow – President of the Committee of Machine Building of the Polish Academy of Science.

1. Host: Prof. Józef Wojnarowski – President of the Committee IFToMM-Poland.
2. Prof. Antoni Gronowicz – Vice-Chair of Committee IFToMM-Poland – gave a talk entitled: „PK TMM – founder of IFToMM”. He emphasised that federation IFToMM was established in Poland in Zakopane in 1969. Some facts as well as photos from the historical founding meetings were shown. The founders – from the Polish Side were Professors Jan Oderfeld and Adam Morecki. The further themes of the talk were as follows: structure of authorities, ranges of activities of Commissions and Technical Committees of IFToMM. Federation IFToMM organize the World Congresses of TMM, where the number of participants varies 400-800, who are coming from almost all countries. The meetings of the supreme authorities i.e. General Assembly are held during congresses. Data on IFToMM, can be found at the website: www.iftomm.org.
3. Prof. Janusz Frączek – Chair of Division of TMM and Robotics (TU Warszawa) – invited all the members of the Committee IFToMM-Poland for ceremony dedicated to commemorate Prof. Jan Oderfeld – founder of IFToMM, professor who the whole life dedicated to TMM.

Talks:

Prof. Józef Wojnarowski: Construction solution of the artificial aortic valves.

Dr Maria Chuchro: 3D printers.

Engineer Grzegorz Koc, MSc (Wiśniowski enterprise). Remarks on „Wiśniowski”.

Prof. Krzysztof Kluszczyński (Silesian TU): Modelling in technology and architecture.

1. Second day of the meeting:
 - visit in laboratories of the University of Applied Science in Nowy Sącz – dr Marek Aleksander.
 - Prof. Stanisław Zawisłak: Current state - Polish Members of IFToMM Authorities.
 - Dr Tomasz Kądziołka „Programs of subjects connected with the University of Nowy Sącz”.
2. Finally, the Participants paid a visit in the factory FAKRO in Nowy Sącz (windows and doors).

REMARKS ON 15-th WORLD CONGRESS OF IFTOMM 2019 IN KRAKÓW AND ZAKOPANE

It would be highlighted that the Congress Delegates having the casting votes : **number of 34 per 42 present**, during the *General Assembly of IFToMM granted to the Committee of IFToMM-Poland (PK TMM) and itself to Poland* organization of the 15 World Congress of IFToMM in 2019 in Cracow and for one day in Zakopane where the meeting of the *General Assembly 2019* will take place. The success is essential whereas it is over Australia and Japan.

The Polish Representatives in Taipei obtained many congratulations.

Prof. Józef Wojnarowski turning to the participants of the conference banquet said:

*Ladies and Gentlemen, Dear Participants, Dear Friends
Firstly:*

It is really a pleasure to have been invited to Taipei. I'd like to thank

Organizing Committee for hospitality and warmly reception. Cordial congratulations to you !

Secondly:

I'd like to thank for support of all Delegates to our proposal organized IFToMM 2019 Congress by the Polish Committee on Theory of Mechanism and Machine Science in Cracow and Zakopane in 2019 in the 50th anniversary of the founding of IFToMM in Zakopane in September 1969.

Thirdly:

On behalf of the Polish IFToMM Committee and myself, I cordially invite all Participants as well as all IFToMM COMMUNITIES to Poland and more specifically to Cracow and Zakopane to celebrate the 50th anniversary of the founding of IFToMM in Zakopane in 1969.

See you all in 2019 in Cracow, old nice City, City of Nicolaus Copernicus – creator of the heliocentric system of the World!

Thank you for attention

In the IFToMM Congress in Taipei, approx. **700 Participants of 45 countries** took part. Number of accepted papers is 522 and additionally 4 review-type papers were also presented. Number of conference sessions: 21. The Proceedings were printed in 5 volumes. **There were 10 Participants from Poland, 7 papers were given.**

Our success was achieved due to active work of the MEMBERS of OUR COMMITTEE on TMM i.e. Committee IFToMM-Poland which has been and currently is positively evaluated by *IFToMM Executive Council*, as well as by *General Assembly*. Our initiative was fully accepted via general meetings of the IFToMM-Poland Committee, participation of the Members of IFToMM Executive Council in conferences (TM&UM) and other events organized in Poland allowed for acceptance and appreciation of our capacities and skills. Finally, due to the letters and motions dedicated to organization of 15 Congress sent to *Executive Council* – we won the support and acceptance. We regularly and on-time have paid the annual membership fee (in an amount of 600 \$US), in fact via a bank transfer from the sources of Polish Academy of Science (PAN) – on our formal motions. An essential meaning had also **Professor Teresa Zielińska, who was elected for the post of the Secretary General of Executive Council (for the second consecutive term)**, as well as the form of presentation of Prof. Tadeusz Uhl on the venue of the future conference and the planned budget.

Professor Marco Ceccarelli will be the IFToMM President since 1st of January 2016, for the period of 4 years, i.e. till the meeting of *General Assembly* in Zakopane in 2019. Prof. Jozef Wojnarowski congratulated Him cordially and simultaneously invited Prof. Marco Ceccarelli for the Jubilee

25th Conferece TMiUM in Rytro (Poland) in 2016. The invitation was accepted and He added that even other Members *Executive Council* would come. It could be concluded that Polish Committee of Theory of Mechanics and Machines ends the current term of office with essential successes.

On 21st November it took place a meeting of the Polish Committee of Theory of Mechanics and Machines in Warsaw University of Technology joined with the unveiling of a plaque commemorating the memory of Professor Jan Oderfeld one of the co-founders of IFToMM in Zakopane in 1969.



Prof. Józef Wojnarowski
Chair of IFToMM Poland

MO ROMANIA

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REPORT OF ACTIVITY: from December 2014 to November 2015

1- DISCUSSION OF RECENT ACTIVITIES

IFToMM MO of Romania is represented by Romanian Association for the Science of Mechanisms and Machines (ARoTMM), founded in 1970, and gathers members from universities all over the country: Brasov, Bucharest, Bacau, Baia Mare, Cluj Napoca, Craiova, Galati, Iasi, Oradea, Pitesti, Resita, Suceava, Timisoara, Targu Jiu, Targu Mures. Developing joint research, harmonizing the education content in the specific topics and networking were the main targets followed by the members and represent the core activities in the past year. The 10th edition of the National Workshop for Mechanisms and Machine Science - SNM10 was organized by ARoTMM - Brasov branch, on June 25-27, 2015. The meeting allowed the analysis of the ARoTMM (Romania MO of IFToMM) development during the past five years and settled the milestones for the coming period.

2- MEETINGS AND VISITS

A General Assembly meeting of ARoTMM took place on June 26, 2015, during The 10th edition of the Romanian Workshop for Mechanisms and Machine Science, SNM10, hosted by Brasov Branch of ARoTMM (MO Romania of

IFToMM).

Visit of Prof. Erwin-Christian Lovasz to Tong Ji University Shanghai (Prof. Lin Song), 21-23 October 2015.

Our members participated to: The 14th IFToMM World Congress, Oct. 25-30, 2015, Taipei, Taiwan; The World Renewable Energy Congress, WREC, 26-28 August, 2015, Florence, Italy; The third Conference on Mechanisms, Transmissions and Applications, MeTrApp 2015, Aachen, Germany, May 6-8, 2015; The Trc-IFToMM Symposium on Theory of Machines and Mechanisms, TrISToMM 2015, Izmir, 14-17 Juny, 2015; The International Conference on Mechanical Engineering, ICOME 2015, 8-9 October 2015, Craiova, Romania; The 10-th International Conference on Optimization of Mechanical Engineering, Manufacturing Systems, Robotics and Aerospace, OPTIROB 2015, 25-28 June 2015, Mangalia, Romania; **ICMERA 2015, International Conference on Aerospace, Robotics, Biomechanics, Neurorehabilitation, Human Motricities, Mechanical Engineering and Manufacturing Systems**, October 29-31, 2015, Bucharest, Romania; The 26th DAAAM International Symposium Intelligent Manufacturing & Automation, October 21-24, 2015, Zadar, Croatia.

3- RESEARCH COLLABORATION AND EXCHANGES

Projects financed by the Romanian Agency for Research:

1. PNII Cooperation, EST IN URBA (ctr. No. 28/2012), Director: Prof. dr. eng. Ion Visa. The project develops integrated work for the development of solar-thermal facades and advanced tracking mechanisms and algorithms for solar-thermal arrays with increased output and durability. The prototype of a novel solar-thermal collector was developed and optimized, subject of patenting. The project has as partners an SME (CTIB), and two universities (Politehnica University of Bucharest and The University of Civil Engineering, Bucharest)
2. PNII Cooperation: CBPhotoDeg (ctr. No.228/2014), Director: Prof. dr. Dana Perniu. The project aims at developing a complex product for infield decontamination of solders subjected to chemical weapon attack. The mobile, energy autonomous unit is designed, involving deployable photovoltaic arrays. Two conceptual solutions, based on two different mechanisms were designed to be implemented on army vehicles. The consortium involves one SMEs, two universities and two R&D Centers.
3. PNII Cooperation: SimPhotoAd (ctr. No. 214/2014), Director: Prof. dr. Maria Visa. The project will develop an energy autonomous wastewater treatment facility, to be implemented in remote areas and allowing the domestic wastewater treatment for reuse. The energy sources are relying on tracked PV platforms, small wind turbines or a PV-wind hybrid, according to the specific renewable energy potential in the implementation location. The project has as partners an SME (EDAS SRL) and Politehnica University of Bucharest.
4. Project CDI 113/19.11.2012, New Haptic Arm Exoskeletons for Robotics and Automation in Space,

acronym EXORAS, Prof. E.-Chr. Lovasz, Politehnica University of Timisoara, project partner leader, Coordinator, Prof. S.D. Stan Technical University of Cluj Napoca.

Projects with EU financing:

1. BioEnergyTrain, BET (H202-LCE-2014-2, grant agreement N 656760). The project, coordinated by the European Sustainable Energy Innovation Alliance aims at developing the framework and the instruments for promoting high level education on implementing renewable energy systems involving biomass. Transilvania University of Brasov is involved in the topics related to product development and optimal solutions for renewable energy mixes implemented at community level.
2. Effect of clouds on solar irradiance (ECSOL – PROGNOSIS, Romanian – Cyprus bilateral cooperation grant, ctr. No. 765/2014). The project aimed at developing novel prediction models for solar radiation as input data in the design of photovoltaic facilities.

Other collaborations:

1. ECSOL-PROGNOSIS – bilateral collaboration project between Transilvania University of Brasov, Romania, and Cyprus University of Technology.
2. The first challenge "Intelligent Vehicles And Machines" of the IMobS3 project, collaboration between Prof. Ioan Doroftei, "Gheorghe Asachi" technical University of Iasi, Romania, and LabEx IMobS3, Universite Blaise Pascal, Clermont-Ferrand, France.

4- CONFERENCE EVENTS

The International Conference on Mechanical Engineering, ICOME 2015, 8-9 October 2015, and it is the third event of a series that has been started in 2010, organized by Craiova Branch of MO Romania of IFToMM.

ICMERA 2015, International Conference on Aerospace, Robotics, Biomechanics, Neurorehabilitation, Human Motricities, Mechanical Engineering and Manufacturing Systems, October 29-31, 2015, organized by Bucharest Branch of MO Romania of IFToMM.

5- MOST RELEVANT PUBLICATIONS (no more than 10)

1. I. Visa, C. Jaliu, A. Duta, M. Neagoe, M. Comsit, D. Ciobanu, M. Moldovan, B.G. Burduhos, R. Saulescu, The Role of Mechanisms in Sustainable Energy Systems, Transilvania University Publishing House, 2015 in English)
2. I. Visa, A. Duta, M. Comsit, M. Moldovan, D. Ciobanu, R. Saulescu, B.G. Burduhos, Design and experimental optimisation of a novel flat plate solar thermal collector with trapezoidal shape for facades integration, Applied Thermal Engineering, 90, 2015, p. 432-443
3. Burduhos, B.G., Visa, I., Neagoe, M., Badea, M. Modeling and optimization of the global solar irradiance collecting efficiency, International Journal of Green Energy, ISSN 1543-5075, DOI:10.1080/15435075.2014.884499, 12(7), 2015, pp. 743-755.

4. Lovasz E.-C., Modler K.-H., Neumann R., Gruescu C.M., Perju D., Ciupe V., Maniu I.: Novel design solutions for fishing reel mechanisms, Chinese Journal of Mechanical Engineering, (2015) 28(4) 726-736.
5. B. Corves, E.-Chr. Lovasz, M. Hüsing (Editors) - Mechanisms, Transmissions and Applications, Proceedings of the Third MeTrApp Conference 2015, Series: Mechanisms and Machine Science, Vol.31, Springer Verlag, 2015, ISBN 978-3-319-17066-4.
6. S Alaci, D A Cerlincă, F C Ciornei, C Filote and G Frunză, Experimental Highlight of Hysteresis Phenomenon in Rolling Contact , Journal of Physics: Conference Series 585 (2015) 012010 doi:10.1088/1742-6596/585/1/012010, 1-9 <http://iopscience.iop.org/1742-6596/585/1/012010>
7. Daniela Tarnita, D. Popa, C. Boborelu, N. Dumitru, D. Calafeteanu, D.N. Tarnita, Experimental Bench Used to Test Human Elbow Endoprosthesis, New Trends in Mechanism and Machine Science, Vol 24 (2015), Springer Verlag, pp. 669-677, Editor: Paulo Flores.
8. I. Dugaesescu, D. Comanescu and A. Comanescu, Structural and Kinematic Particularities of the Micro-Robot Mechanisms, Applied Mechanics and Materials Vol. 762, 2015, pp., 205.
9. I. Tabără, Synthetic Representation of the Robotic Assembly, Applied Mechanics and Materials Vol. 762, 2015, pp. 277.
10. B. Hichri, J.-C. Fauroux, L. Adouane, I. Doroftei, Y. Mezouar, Lifting Mechanism for Payload Transport by Collaborative Mobile Robots, New Trends in Mechanism and Machine Science, Vol 24 (2015), Springer Verlag, pp. 157-165, Editor: Paulo Flores.

6- FUTURE PLANNED ACTIVITIES

- Organizing the next MTM & Robotics Joint Conferences, 26-27 October, 2016, Aachen, Germany.
- Scientific support for The 7th International Conference Advanced Concepts in Mechanical Engineering, 09-10 June, 2016, Iasi, Romania.
- The 11th edition of the Romanian Workshop for Mechanisms and Machine Science, SNM11, will be hosted by Cluj-Napoca Branch of ARoTMM (MO Romania of IFToMM).

7- RELEVANT PHOTOGRAPHS, FLYERS

- Participants to The 10th National Workshop for Mechanisms and Machine Science, SNM10



- ARoTMM Diploma Awards, to SNM10



MO SERBIA

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REPORT OF ACTIVITY: from July 1, 2014 to November 1, 2015

1- DISCUSSION OF RECENT ACTIVITIES

Reformed Curriculum for the Mechatronics subject at University of Belgrade. Introduced programming of PLC in Curriculum, in order to develop “hands on” skill for each student. Published new book of Mechatronics.

Completed and presented Doctoral Thesis at TMM Dept., candidate Emil Veg, title **INTEGRITY ASSESSMENT BY CROSS CORRELATED MODAL IDENTIFICATION OF STEEL STRUCTURES**

Two doctoral students applied for Doctoral Thesis.

2- MEETINGS AND VISITS

Regular meetings and cooperation on joint projects Mechanical Engineering Faculty, University of Belgrade Serbia and University of Maribor, Slovenia

3- RESEARCH COLLABORATION AND EXCHANGES

Joint research Mechanical Engineering Faculty, University of Belgrade, Serbia and University of Maribor, Slovenia: Detection of modal parameters on grid towers in high voltage electric network.

4- CONFERENCE EVENTS

THE THIRD INTERNATIONAL CONFERENCE “MECHANICAL ENGINEERING IN THE XXI CENTURY”

The main goal of the Third International Conference “Mechanical Engineering in the 21st Century” is to bring

together researchers from scientific and industrial institutions so that they can present and communicate their newest results, create personal contacts, promote research within the area of mechanical engineering, and stimulate the exchange of results and ideas within the fields encompassed by the Conference.

Conference topics are:

- Energetics and process engineering,
- Mechanical structures, development, and engineering,
- Mechatronics and control,
- Production information technologies,
- Traffic engineering, transport, and logistics,
- Theoretical and applied mechanics and mathematics,
- Engineering management,
- Future of work, engineering and professional ethics in the era of globalization.

5- MOST RELEVANT PUBLICATIONS (no more than 10)

1. L. Cveticanin, Strongly Nonlinear Oscillators – Analytical Solutions, Series: Undergraduate Lecture Notes in Physics, ISBN 978-3-319-05272-4, Springer, 2014.
2. L. Cveticanin, Dynamics of the Mass Variable Body. Chapter 3, in “Dynamics of Mechanical Systems with Variable Mass”, Series CISM International Centre for Mechanical Sciences, Vol.557, Eds: H. Irschik, A. Belyaev, Springer, 2014, pp.107-165.
3. L. Cveticanin, *Coupled Van der Pol oscillator with non-integer order connection*, Communications in Nonlinear Science and Numerical Simulation 19 (2014), pp. 3362-3373
4. L. Cveticanin, Gy. Mester, I. Biro, *Parameter influence on the harmonically excited Duffing oscillator*, Acta Polytechnica Hungarica, Vol.11, No.5, 145-160, 2014.
5. M. Bayat, I. Pakar, L. Cveticanin, *Nonlinear free vibration of systems with inertia and static type cubic nonlinearities: An analytical approach*, Mechanism and Machine Theory, 77, 50-58, 2014.
6. Petković, D., Issa, M., Pavlović, N.D., Zentner, L., *Potential of adaptive neuro-fuzzy inference system for contact positions detection of sensing structure*, 2015, Measurement, Vol. 61, 234-242.
7. Petković, D., Shamshirband, S., Anuar, N.B., Sabri, A.Q., Rahan, Z.A., Pavlović, N.D., *Input Displacement Neuro-fuzzy Control and Object Recognition by Compliant Multi-fingered Passively Adaptive Robotic Gripper*, 2015, Journal of Intelligent & Robotic Systems, Springer, DOI 10.1007/s10846-015-0182-6.
8. Milojević A., Pavlović N.D., *Development of a new adaptive shape morphing compliant structure with embedded actuators*, 2015, Journal of Intelligent Material Systems and Structures, DOI: 10.1177/1045389X15590270.
9. A. Dragin, Lj. Konstantinovic, A. Veg, L. Schwirtlich, *Gait training of poststroke patients assisted by the Walkaround (body postural support)*, International Journal of Rehabilitation Research, 2014, vol. 34/1, pp 22-28

10. E. Veg, A. Veg, G. Sinikovic, R. Andrejevic, N. Gubelj, *Design of Coupled Slider Crank Mechanism for Orbiting motion*, International Journal of Simulation Modelling, 2015, vol. 14/2, pp 189-200
11. L. Cveticanin, *On the truly nonlinear oscillator with positive and negative damping*, Applied Mathematics and Computation, Vol.243, 2014, 433-445.
12. J. Sarosi, I. Biro, J. Nemeth, L. Cveticanin, *Dynamic modeling of a pneumatic muscle actuator with two-direction motion*, Mechanism and Machine Theory, 85, 25-34, 2015.
13. L. Cveticanin, *Principle of generalized velocities in dynamics of planar separation of a rigid body*, Acta Mechanica, Vol.226, 2511-2525, 2015.
14. L. Cveticanin, M. Zukovic, *Motion of a motor-structure non-ideal system*, European Journal of Mechanics A/Solids, 53, 229-240, 2015.

6- FUTURE PLANNED ACTIVITIES

- **Research study: Development of the new artificial skin pressure sensors made by smart materials**, within the DAAD bilateral project Serbia-Germany: "Development and optimal design of adaptive compliant mechanisms with inherent actuators", Technical University of Ilmenau, October-November 2015, researchers: Andrija Milojević and Miša Tomić.
- Applying for bilateral project Serbia-Croatia: "Development of energy harvesting devices for powering low consumption sensors", 2016-2017, Project managers: Prof. Nenad D. Pavlović, Faculty of Mechanical Engineering Niš, and Prof. Dr. sc. Saša Zelenika, University of Rijeka – Faculty of Engineering, Croatia.

MO SINGAPORE

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1- DISCUSSION OF RECENT ACTIVITIES

Singapore participated in the 2015 IFToMM World Congress in Taipei with 4 presentations in the area of robotics. Most of them were the results from the A*STAR Industrial Robotics Programme.

Besides the above, MO Singapore members have organised a number technical seminars. Some of them are as follows:

- (1) Optimality in Robot Trajectory Generation, Motion Planning, and Control: State-of-the-Art and Future Challenges by Frank C. Park on 10 February 2015
- (2) Simultaneous Localisation and Mapping: A Fifteen Year Journey by Gamini Dissanayake on 3 September 2015
- (3) Event-driven Control, Communication, and Optimization by Christos Cassandras on 3 June 2015

MO SLOVAKIA

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1- DISCUSSION OF RECENT ACTIVITIES

The main activities (from the November of 2014 to the November 2015) of National Committee of IFToMM Slovakia in collaboration with universities of technology, mainly Faculty of Mechanical Engineering in Bratislava, Kosice and Zilina, and Institute of Materials and Machine Mechanics of the Slovak Academy of Science were organized international conferences. The 9th year of the international conference for young researchers and PhD. students ERIN was held in Moninec in Czech Republic. This year of ERIN Conference was organized by **Faculty of Mechanical Engineering CVUT Prague, Faculty of Technical Chemistry TU Wien in cooperation with Faculty of Mechanical Engineering in Bratislava**. This conference welcomed nearly 114 participants from 9 countries. Participants heard 53 lectures which were presented by representatives of machine-producing companies, universities and research institutions. Concept of the conference has originated at the Faculty of Mechanical Engineering in Bratislava and dates back to 2007 when the first conference was held. Modest beginnings were succeeded by a successful development and ERIN became a prestigious conference aimed at PhD. students and young researchers (see Fig.).

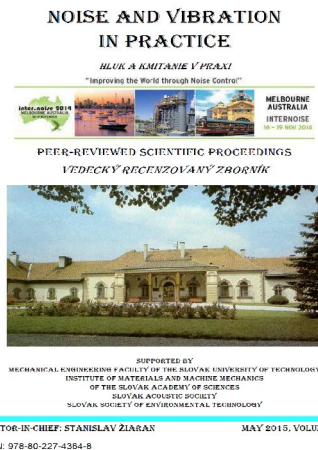


21st International Conference "Engineering for Environment Protection" was held in Senec, Slovakia from 23rd to 25th of June 2015 (see next Fig.). More than 70 scientific papers have been presented at the conference, which took part 143 participants from the whole Europe. The Conference was held under auspices of Minister of Environment of the Slovak Republic and the Rector of the Slovak University of Technology. Conference topics for the year 2015 were:

- The Engineering and the Source Usage of Renewable Forms of Energy – the sources of recycled form of energy vs. the environment; the alternative energy from the aspect of environmental protection; the protection of environment components at the process of obtaining energy;
- Progress in the Waste Treatment Technology – the present status and the expected trends in concerned field, mechanical, biological waste treatment, thermal waste treatment, environmental technologies, reduction of quantity of technological waste. For more information visit: <http://top.sjf.stuba.sk/eindex.htm>



XX. International acoustic conference “Noise and vibration in Practice” was again held in Kocovce. More than 25 papers have been presented at the conference from universities and practices about noise and vibration control machines and machineries. The participants (more than 50) are usually young people from the middle Europe. Output of the conference is the Peer-reviewed scientific proceedings of papers in printed form (see Fig.).



Other international conferences: International Conference Modelling of Mechanical and Mechatronic Systems MMaMS 2014 (November 25th-27th 2014, High Tatras). Conference topics were modelling and simulation of mechanical, mechatronic and biomechanical systems, design of mechanical, mechatronic, biomechanical and robotic systems, experimental methods in mechanics, electronic, mechatronics, biomechanics and robotics. 66 contributions were presented by 42 attendants, and The International Scientific Conference "PRO-TECH-MA 2015 and Surface Engineering 2015" has been held from 7th-9th October 2015, in High Tatras, Slovakia. Conference topics include progressive materials, their properties, evaluation methods, theory of technological processes of metal forming, welding, surface treatment, machining and plastic processing, simulation methods in technologies, advanced materials, trends in the formation of new surfaces and coatings, degradation processes and triboprocesses. About 55 attendees from Slovakia, Poland, Czech Republic and Ukraine took part at the Conference, and more than 60 reports have been presented. These reports were published in the collection of proceedings. See: <https://www.sjf.tuke.sk/ktam/conf2015/index.html>, and

Conference Machine Diagnostics DIS (October 6th-7th, 2015, Kosice). More than 20 papers have been presented and more than 40 attendants were on the conference. Topics of conference were technical diagnosis as support of decision (vibrodiagnostics, tribodiagnosics, thermal diagnostics), progressive non-destructive and testing methods, experimental methods, safety and environment etc.

2- FUTURE PLANNED ACTIVITIES

We would like to kindly invite you to the 10th year of ERIN Conference which is very progressively developed conference. The next year of ERIN conference will be organized by Faculty of Mechanical Engineering of University of Zilina, in May 2016. For more information visit <http://www.erin-conference.cz/>.

The 21th Noise and Vibration in Practice will be held at Slovak University of Technology, in Kocovce, Slovakia, May 30-31, 2016. The two day conference is sponsored by Institute of Materials and Machine Mechanics of Slovak Academy of Science, Bruel&Kjaer, the Slovak Chamber of Civil Engineers, and the Mechanical Engineering Faculty (see below).

The 12th International Scientific Conference “Optimisation of Mechanical Systems and Machinery” will be held in June 8th-10th 2016 in conference venue Jasna, Demanovska Dolina, Slovakia. Conference scope is focused to optimisation of mechanical systems and machinery with regard to vibrations and noise; identification of torsional oscillation impact on vibration and noise of mechanical systems and machinery; flexible shaft couplings and their application in the mechanical systems and in machinery; new kinds of flexible shaft couplings; new tuning methods of torsional oscillating of the mechanical systems; identification of effects of shape and stiffness parameters in gear units on vibrations and noisiness of gearboxes in mechanical system drives; research of machine part influences with regard to vibrations and noise of the mechanical systems and machinery on the basis of simulation; results of scientific-research activity in the area of optimisation of torsional oscillation, vibration and noisiness of mechanical systems and machinery; vibration diagnostics of mechanical systems and machinery; results of monitoring of mechanical systems and machinery; mechatronics in the mechanical systems; combustion

engines and their application in various mechanical systems and equipment; optimization methods when designing technology in construction, transport, automotive, shipping, agricultural, forestry and timber areas; optimization plans in biomass research; energy potential of biomass and its comprehensive utilization etc. For more information, please visit website of conference: <http://web.tuke.sk/sjf-okacs/konferencia>.

3- THE AWARDS

Faculty of Mechanical Engineering in Kosice has been awarded as winner of National Price of Quality 2015 of Slovak Republic in category “C – Organisations of public sector” (see next Fig.). Under the auspices of president of Slovak Republic, the ceremony of competition results has been presented in November, 10th 2015 in historic building of National Theatre. Also faculty has been awarded for “Best scientific publication”.



4- ESPECIALLY FOR STUDENTS

The Student Scientific Conference on the Faculty of Mechanical Engineering of Slovak University of Technology in Bratislava (STUBA) was held on 15th of April 2015. In the ten sections competed 88 authors with 85 scientific works.

STUBA Green Team and AM-team is a project of students, whose the main aim is to design, develop and build formulas with electric hybrid and classic combustion engine and represent our country at the races within global competition Formula Student/SAE. The team has been working since 2009, currently consists approximately of 40 active members and it was participated in competitions at Hockenheim (Germany), Silverstone (England) and Red Bull ring (Austria). There is no better lesson, than interesting project from practice.



Competition of student in CNC programming (March 19th 2015, Kosice) 22 students attended the competition. The competition was in two sections: programming of CNC machine HeidenhainTNC 426 and CAM programming of CNC machines with supporting of CAD/CAM systems, and



FLL – First Lego League Competition (December 15th, 2015 Kosice) – Robotics competition for children from elementary school. The aim is to build and program robot. 14 teams compete in four sections: Robot Game, Robot Design, Research, Team Work.

MO SLOVENIA

Prof. Karl Gotlih

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REPORT OF ACTIVITY: from January 2015 to December 2015

1- DISCUSSION OF RECENT ACTIVITIES

The year 2015 was dedicated to the participation on the IFToMM world conference 2015. The participants from Slovenia, Croatia and Serbia have decided to organize the travel to Taipei together. During the travel we could exchange our experiences and also our vision of further development of the organization IFToMM.

2- MEETINGS AND VISITS

Annual meeting of the Slovenian society for mechanics was held in Moravske toplice from 24th September to 25th September. The proceedings can be found on the web page of the society <http://www.drustvozamehaniko.si/index.htm>.

3- RESEARCH COLLABORATION AND EXCHANGES

The Faculty of Mechanical Engineering in Maribor has strong research collaboration with the Faculty of Mechanical Engineering in Belgrade, Serbia and the Faculty from Rijeka (Croatia) is in the field of rotor dynamic connected to the Faculty of Mechanical Engineering in Ljubljana.

4- CONFERENCE EVENTS

Three participants from Slovenia have been at the IFToMM world conference in Taipei 2015. Slovenia was presented with three papers. One participant from Slovenia was chair of two sections.

5- FUTURE PLANNED ACTIVITIES

In the year 2016, the Slovenian national committee will meet and decide about a new president. We will also suggest some changes in the names of delegates from Slovenian in the TC's.

6- OTHER RELEVANT INFORMATION

At the TC for Robotics and Mechatronics at the meeting in Taipei 2015, we gave a suggestion for research collaboration with regard to young scientists from universities. The idea is to give young perspective researchers the opportunity to visit other laboratories and work there for some time period to get high quality experiences in the field of Robotics and Mechatronics.

7- RELEVANT PHOTOGRAPHS, FLYERS

The delegations from Serbia, Croatia and Slovenia on the IFToMM world congress 2015



The above information will be used in IFToMM Newslettter, and will be posted in the IFToMM webpage

MO SPAIN

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REPORT OF ACTIVITY: from January 2015 to December 2015

1- DISCUSSION OF RECENT ACTIVITIES

The Department of Mechanical Engineering of the

Universidad Carlos III of Madrid (UC3M) organized the 1st National Olympiads on Mechanism and Machine Theory (October 15-16th 2015). The team from Sevilla was the winner of the present edition.



Prof. Victor Petuya presented the capabilities of GIM software during the Tutorial organized by the TC on Linkages and Mechanical Controls during the IFToMM WC. More than 30 students attended the Tutorial.

2- MEETINGS AND VISITS

Spanish members of IFToMM from Madrid, Sevilla, Jaen and Bilbao attended the IFToMM WC in Taipei. They also participated in the General Assembly on October 28th held these days in Taipei as can be seen in the following photo.



3-RESEARCH COLLABORATION AND EXCHANGES

Prof. Victor Petuya as co-chair of the IFToMM TC on Linkages and Mechanical Controls attended the IFToMM EC meeting (October 24-25th 2015) during the Taipei WC to inform about the activities of his TC together with Prof. E.C Lovasz. He also attended to the TC meeting on October 26th during the congress.

Prof. Charles Pinto attended on October 26th the TC on Computational Kinematics meeting during the IFToMM WC in Taipei.

4- CONFERENCE EVENTS

On October 1-2nd was held in Salamanca the XV National Meeting of Mechanical Engineering Teachers. Some interesting topics were discussed. One of the discussions was focused on the indexes to assess the activity of the researchers in the mechanical engineering areas. The other one was about the structure of the contents on Mechanism and Machine Theory and Mechanical Design subjects in the BSc and MSc degrees.

5- FUTURE PLANNED ACTIVITIES

On September 20-23th 2016 in the city of Elche will be held the XXI National Congress of Mechanical Engineering.

6- OTHER RELEVANT INFORMATION

On January 2015 Prof. Fernando Viadero left the Spanish MO Chair. We thank him for the work done during his two mandates and his promotion of new activities in Spain IFToMM MO.

Prof. Jose Luis San Roman was elected as the new chair of the Spanish Association of Mechanical Engineering.

Prof. Alfonso Hernández was designated to be the Spanish MO Chair in IFToMM.

During the IFToMM GA in Taipei, Prof. Fernando Viadero was elected as member of the EC.

MO SWITZERLAND

Prof. Hannes Bleuler, Robotic Systems Lab LSRO, EPFL Lausanne

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REPORT OF ACTIVITY: from January 1, 2015 to December 31, 2015

1- DISCUSSION OF RECENT ACTIVITIES

Participation at World Congress 2015 in Taipei 2-MEETINGS AND VISITS Participation in MESROB 2015 (Medical and Service Robotics), in Nantes, France, meeting many IFToMM Colleagues; Participation at the German Language IFToMM D-A-CH Workshop in Dortmund

2- RESEARCH COLLABORATION AND EXCHANGES

Several projects between Switzerland and Japan, Romania, France, Germany, Austria and many others.

3- CONFERENCE EVENTS

No IFToMM conference in Switzerland in 2015

4- MOST RELEVANT PUBLICATIONS (no more than 10)

Bleuler, Bouri, Mondada, Pisla, Rodic, Helmer, editors *New Trends in Medical and Service Robots*, Springer, vol 38, 2015 (This is the Proceedings Volume of the 3rd MESROB Workshop, Lausanne, Switzerland, 2014)

5- FUTURE PLANNED ACTIVITIES

Participation in D-A-CH, Enlargement of Swiss member base

MO TURKEY

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REPORT OF ACTIVITY: from January 1, 2015 to November 15, 2015

1- DISCUSSION OF RECENT ACTIVITIES

MO Turkey has co-organized

- National Winter School on Dynamics of Machinery with Theory and Practical Applications in Middle East Technical University, Ankara – February 3-8, 2015
- TrC-IFToMM Symposium on Theory of Machines and Mechanisms (TrISToMM) in İzmir Institute of Technology (National symposium with international participation – under patronage of IFToMM), İzmir – June 14-17, 2015 (<http://umts.iyte.edu.tr/en/>)
- National Workshop on Analytical and Computational Methods in Robot Kinematics in Gaziantep University, Gaziantep – August 31-September 3, 2015

Turkish Machine Theory Association of MO Turkey acquired publishing certificate and has published two e-books:

- Kiper G., Dede M. İ. C. (Eds.). (2015) Proceedings of TrC-IFToMM Symposium on Theory of Machines and Mechanisms – ISBN: 978-605-84220-0-1, Language: Turkish/English, (Available online at: http://www.iftomm.org/index.php?option=com_content&view=article&id=146&Itemid=233)
- Kemal Ö. (2015) Robot Kinematiği - Seri ve Paralel Manipulatörlerin Analitik ve Yarı-Analitik Yöntemlerle Konum ve Hız Analizleri – ISBN: 978-605-84220-1-8, Language: Turkish

2- MEETINGS AND VISITS

- Dr. Gökhan Kiper (Turkey) visited Dr. Volkert van der Wijk (Netherlands) at University of Twente on May 9, 2015.
- Dr. Sandipan Bandyopadhyay (India) gave a series of lectures in June 9-12 on Singularity Analysis and also a seminar entitled "The Mathematics and Engineering of Parallel Manipulators" to the students and researchers in İzmir Institute of Technology, İzmir.
- MO Turkey General Assembly was held İzmir Institute of Technology on June 15, 2015 during TrC-IFToMM Symposium on Theory of Machines and Mechanisms.
- Technical Committee for Linkages and Mechanical Controls had a meeting in İzmir Institute of Technology on June 16, 2015 during TrC-IFToMM Symposium on Theory of Machines and Mechanisms.
- Dr. Volkert van der Wijk (Netherlands) has given a seminar entitled "Design of Inherently Statically and Dynamically Balanced Mechanisms with Applications in Robotics and Kinetic Architecture" on June 18, 2015 in İzmir Institute of Technology, İzmir.

3- RESEARCH COLLABORATION AND EXCHANGES

- Görkem Karabulut and Talha Eraz – MSc Students in Dpt. of Mechanical Engineering, İzmir Institute of Technology – conducted research at Dpt. of Mechanism Theory and Dynamics of Machines (IGM), RWTH Aachen University, Germany under supervision of Prof. Burkhard Corves in March- September 2015.
- Dr. Volkert van der Wijk (University of Twente), Dr. Gökhan Kiper and Abdullah Yaşır (İzmir Institute of Technology) worked on dynamically balanced canopy designs. They published a conference paper in June. The joint research studies continue.

4- CONFERENCE EVENTS

Dr. Can Dede and Dr. Gökhan Kiper (İzmir Institute of Technology) attended 3rd Conference on Mechanisms, Transmissions and Applications in Aachen/Germany, May 6-8, 2015 and IFToMM World Congress, in Taipei/Taiwan, Oct. 25-30, 2015.

5- MOST RELEVANT PUBLICATIONS (no more than 10)

- Bayar G., Bergerman M., Koku A. B., Konukseven E. İ.; *Localization and control of an autonomous orchard vehicle*. Computers and Electronics in Agriculture, 2015, 115: 118-128.
- Doğmuş Z., erdem E., Patoğlu V. *RehabRobo-Onto: Design, development and maintenance of a rehabilitation robotics ontology on the cloud*. Robotics and Computer-Integrated Manufacturing, 2015, 33: 100-109.
- Erkaya S., Doğan S.; *A comparative analysis of joint clearance effects on articulated and partly compliant mechanisms*. Nonlinear Dynamics, 2015, 81:323-341.
- Erkaya S., Doğan S., Ulus Ş.; *Effects of joint clearance on the dynamics of a partly compliant mechanism: Numerical and experimental studies*. Mechanism and Machine Theory, 2015, 88: 125-140.
- İtik M., Şahin E., Ayaş M. Ş.; *Fractional order control of conducting polymer artificial muscles*. Expert Systems with Applications, 2015, 42(21): 8212-8220.
- Kırıl B. G., Kırıl Z., Öztürk H.; *Stability analysis of delaminated composite beams*. Composites Part B: Engineering, 2015, 79: 406-418
- Kiper G., Bilginçan T.; *Function generation synthesis of spherical 5R mechanism with regional spacing and Chebyshev approximation*. Mechanism and Machine Theory, 2015, 90: 37-46.
- Tanık Ç. M., Parlaktaş V., Tanık E. Kadioğlu S.; *Steel compliant Cardan universal joint*. Mechanism and Machine Theory, 2015, 92: 171-183.
- Yıldırım Ş., Yaşar E.; *Development of an obstacle-avoidance algorithm for snake-like robots*. Measurement, 2015, 73: 68-73.
- Zuberi M. J. S., Esat V.; *Investigating the mechanical properties of single walled carbon nanotube reinforced epoxy composite through finite element modelling*. Composites Part B: Engineering, 2015, 71: 1-9.

6- FUTURE PLANNED ACTIVITIES

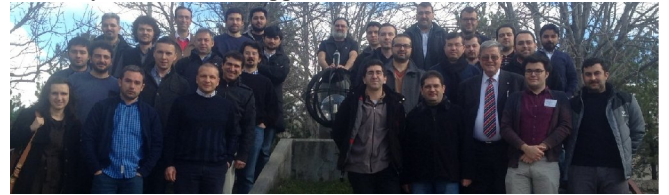
- Winter School on Robot Dynamics will be held at Gazi University, Ankara in February 2016
- Summer School on System Dynamics will be held in September 2016
- IFToMM patronaged 4th Conference on Mechanisms, Transmissions and Applications will be held in Karadeniz Technical University, Trabzon on July 3-5, 2017
- 18th National Symposium on Theory of Machines will be held in Karadeniz Technical University, Trabzon on July 5-7, 2017

7- OTHER RELEVANT INFORMATION

- Prof. Eres Söylemez (Turkey) and Prof. Rasim Alizade (Azerbaijan) were rewarded the Technical Committee for Linkages and Mechanical Controls Service Award during TrC-IFToMM Symposium on Theory of Machines and Mechanisms.
- During the GA of IFToMM on October 28, 2015, Dr. Can Dede (İzmir Institute of Technology) has been elected as an EC Member of IFToMM for 2016-2019 period.

8- RELEVANT PHOTOGRAPHS, FLYERS

National Winter School on Dynamics of Machinery with Theory and Practical Applications:



TrC-IFToMM Symposium on Theory of Machines and Mechanisms:



National Workshop on Analytical and Computational Methods in Robot Kinematics:



MO VIETNAM

Prof. Nguyen Van Khang, Hanoi University of Science and Technology
Email: khang.nguyenvan2@hust.edu.vn

REPORT OF ACTIVITY: from January 1, 2015 to November 30, 2015

1- DISCUSSION OF RECENT ACTIVITIES

MO Vietnam actively collaborated with local universities to organize annual Olympiad exams on the subjects of Machine Theory, Machine Element and Engineering Mechanics for students of Universities in Vietnam at April 2015.

2- RESEARCH COLLABORATION AND EXCHANGES

Members of IFToMM MO Vietnam are taking part as principal investigators in a number of research project financed by the Vietnam National Foundation for Science and Technology Development (NAFOSTED) on Machinery Mechanics

3- CONFERENCE EVENTS

- Co-organizing the National Conference on Engineering Mechanics at the University Danang (Vietnam), April 09, 2014.
- Co-organizing the 16th Asian Pacific Vibration Conference (APVC 2015) in Hanoi, November 24-26, 2015. **Prof. Nguyen Van Khang (IFToMM Vietnam) is the local chairman and Prof Nguyen Phong Dien (IFToMM Vietnam) the Co-Chairs of Local Organizing Committee. APVC 2015 was successfully held at Hanoi University of Science and Technology with 140 lectures presented by scientists from 11 different countries. (conference homepage is <http://apvc2015.vn>). Some of the research areas were: Vibration of continuous systems and structure dynamics, Vibration of discrete systems and machine dynamics, Control and Optimization of dynamic systems, Vibration and Noise.**

Here are photos of APVC 2015's participants:



4- MOST RELEVANT PUBLICATIONS

Nguyen Van Khang and Nguyen Phong Dien, *Balancing Conditions of Planar and Spatial Mechanisms in the Algebraic Form*. Book chapter in: Dan Zhang and Bin Wei (Editors), *Dynamic Balancing of Mechanisms and Synthesizing of Parallel Robots*, Springer 2016.

5- FUTURE PLANNED ACTIVITIES

- October, 2016: Co-organizing the National Conference on Engineering Mechanics and Automation at Hanoi University of Science and Technology (Vietnam).
- August, 2016: Co-organizing the 4rd International Conference on Engineering Mechanics and Automation (ICEMA-4) in Hanoi.

NEWS FROM TECHNICAL COMMITTEES

[A total of 10 reports]

TC COMPUTATIONAL KINEMATICS

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Email: doina.pisla@mep.utcluj.ro

TC Webpage:

[http://www.iftomm.org/index.php?option=com_iftommembers&view=memberslisting&list=2&tcpc=tc&tit=Technical%20Committees&Itemid=120#Technical Committee for Computational Kinematics \(www.cester.utcluj.ro/tc-ck\)](http://www.iftomm.org/index.php?option=com_iftommembers&view=memberslisting&list=2&tcpc=tc&tit=Technical%20Committees&Itemid=120#Technical%20Committee%20for%20Computational%20Kinematics)

REPORT OF ACTIVITY: from September 2014 to October 2015

1- DISCUSSION OF RECENT ACTIVITIES

During the period, the TC of Computational Kinematics has been very active in the IFToMM by organizing conferences and meetings, establishing new and reinforcing already existing research collaborations and exchanges with the aim to develop new research and join collaborations and publishing Journal papers and editing books, as detailed in the following. In addition, three new members were approved namely, Assistant Prof. Nina PATARINSKY

ROBSON; Assistant Prof. Chin-Hsing KUO, Prof. Andreas MUELLER.

2- MEETINGS AND VISITS

The following meetings and visits were organized among members of the TC CK:

1. Manfred Husty visited IRCCyN, Nantes France between 7-10.04.2015 within the joint project Austria-France.
2. Doina Pisla visited University of Innsbruck between 24-29.11.2015 within the joint research project Austria-Romania (2014-2015).
3. Erika Ottaviano visited University of Innsbruck between 18-24.05.2015 within the joint ERASMUS + agreement between Austria-Italy (2014/2015).
4. Philippe Wenger visited University of Innsbruck between 16-20.12.2014 within the joint project Austria-France.
5. Erika Ottaviano visited the School of Mechanical Engineering, Dalian University of Technology, Dalian, China, between 22-25.10.2015.

3-RESEARCH COLLABORATION AND EXCHANGES

Among the members of the TC CK are many collaborations on an institutional or private basis. There should be some effort to channel these activities in joint project applications e.g. within European research frameworks.

An important issue is to improve the connections between the universities and the companies through direct projects regarding implementing of the research results in the industry.

Bilateral research project between Austria-France in the field of Parallel Robots - Project approved 2013-2014.

Bilateral research project between Austria-Romania in the field of Parallel Robots for Medical Applications - Project approved 2014-2015

Bilateral Erasmus Academic Agreement between Bilbao, Spain, and Cassino, Italy in the field of Mechanical Engineering with Professors and Students Mobility (2014-2021)

Bilateral Erasmus Academic Agreement between Nantes, France, and Cassino, Italy in the field of Mechanical Engineering and Robotics with Professors and Students Mobility (2014-2021)

Bilateral Erasmus Academic Agreement between Innsbruck, Austria, and Cassino, Italy in the field of Mechanical Engineering with Professors and Students Mobility (2014-2021)

Bilateral Erasmus Academic Agreement Izmir, Turkey, and Cassino, Italy in the field of Mechanical Engineering with Professors and Students Mobility (2014-2021)

Bilateral Erasmus Academic Agreement between Duisburg, Germany, and Cassino, Italy in the field of Mechanical Engineering with Professors and Students Mobility (2014-2021)

Bilateral Erasmus Academic Agreement Bilbao, Spain-Cluj,Romania in the field of Robots with Professors and Students Mobility (2014-2021).

Bilateral Erasmus Academic Agreement Innsbruck, Austria-Cluj, Romania in the field of Robots with Professors and

Students Mobility (2014-2021).

Bilateral Erasmus Academic Agreement Duisburg, Germany-Cluj, Romania in the field of Robots with Professors and Students Mobility (2014-2021).

Joint project between Universite Laval (C. Gosselin) and University Innsbruck approved.

Joint project between Austria-France (IRCCyN-Univ. Innsbruck) funded by ANR and FWF – Project approved 2014-2018

4- CONFERENCE EVENTS

The following conferences were organized during the period:

1. Organization of the Computational Kinematics Session within IFToMM World Congress 2015, Oct 25-30, 2015, Taipei, Taiwan. Almost all members of the TC CK participated in this conference. The meeting of the TC CK was held in Taipei on 26.10.2015.
2. Organization of the Fourth International Workshop on Medical and Service Robots-MESROB 2015, 8-10 July 2015, Nantes, France, Organizing Committee: Philippe Wenger (Chair), Doina Pisla, Manfred Husty, Aleksandar Rodic, Francesco Mondada, Mohamed Bouri, Patrick Helmer, C. Chevallereau, Y. Aoustin, S. Sakka, V. Aralelyan, I. Giannopulo, P. Garrec. Several members of the TC participated in this conference. <http://mesrob2015.irccyn.ec-nantes.fr/>

6. Teaching activities

Manfred Husty, J.P. Merlet and Philippe Wenger from the TC CK have participated as lecturers in the CISM Advanced Course on Singular Configurations of Mechanisms and Manipulators in Udine, Italy, 22-26 sept. 2014.

5- MOST RELEVANT PUBLICATIONS (no more than 10)

1. Springer book: Editors: Pisla, D., Bleuler, H., Rodic, A., Vaida, C., Pisla, A. (Eds.), *New Trends in Medical and Service Robots. Theory and Integrated Applications*. Hardcover ISBN 978-3-319-01591-0, 2014, <http://www.springer.com/us/book/9783319015910>.
2. Springer book: Editors: Rodić, Aleksandar,Pisla, Doina,Bleuler, Hannes (Eds.), *New Trends in Medical and Service Robots. Challenges and Solutions* ISBN 978-3-319-05431-5, 2014, <http://www.springer.com/us/book/9783319054308>
3. Springer book: Editors: Bleuler, H., Bouri, M., Mondada, F., Pisla, D., Rodic, A., Helmer, P. (Eds.), *New Trends in Medical and Service Robots. Assistive, Surgical and Educational Robotics*. ISBN 978-3-319-23832-6, 2016, <http://www.springer.com/us/book/9783319238319>
4. Special Issue in Mechanical Sciences Journal (Eds. Doina Pisla and Paolo Flores) with the best selected papers from the 5th EUCOMES 2014, Guimaraez, Portugal, <http://www.mechanical-sciences.net/>

6- FUTURE PLANNED ACTIVITIES

The following conferences are planned for 2016:

1. ARK 2016- *The 15th Advances in Robot Kinematics Conference to be held June 27-30, 2016 will be*

organized in Nice France by Jean-Pierre Merlet and Jadran Lenarčić.

2. The fifth International Workshop on Medical and Service Robots-MESROB 2016 will be organized by Prof. Manfred Husty and Prof. Michael Hofbauer in Graz, Austria, 8-10 July 2015.
3. The Sixth European Conference on Mechanism Science –EUCOMES 2016- will be organized by Philippe Wenger, in Nantes France, 20-24 sept. 2016

7- OTHER RELEVANT INFORMATION

A detailed new webpage has been created with detailed information on the TC of Computational Kinematics. In particular, the following items have been included: Home; Chair; Members; Objective; Activities; Events; Latest News; Contacts; Annual Reports ; Links
 The aim of the page, created by the secretary Dr. Erika Ottaviano under the guidance of the Chair Prof. Dr. Ing. Doina Pisla and Deputy Chair Dr. Philippe Wenger and it can be found at: <http://www.cester.utcluj.ro/tc-ck/default.html>

8- RELEVANT PHOTOGRAPHS, FLYERS



Fig. 1. Flyer of the MESROB 2015conference.



Fig. 2. Flyer of the ARK 2016 conference.



Fig. 3. Flyer of the MESROB 2016 conference.



Fig. 3. Flyer of the EUCOMES 2016 conference.

TC GEARING AND TRANSMISSIONS

Professor Daizhong Su, Advanced Design AND Manufacturing Engineering Centre, Nottingham Trent University UK

Email: daizhong.su@ntu.ac.uk

REPORT OF ACTIVITY: from January to October 2015

1- DISCUSSION OF RECENT ACTIVITIES

The members of this TC actively participated in IFToMM World Congress held 25-30 2015 in Taipei. More than 30 papers presented at the congress were from this TC.

2- MEETINGS AND VISITS

- (1) The TC meeting was held on 26th October 2015, Taipei. The meeting reviewed the TC's activities conducted in the past year and planned activities in the future.
- (2) Professor Daizhong Su of Nottingham Trent University (UK), Chair of this TC, visited Professor Qin of the State Key Laboratory of Mechanical Transmission, Chongqing University (China) in 22-23 July 2015. During the meeting, they discussed the research and activities related to this TC.

3- RESEARCH COLLABORATION AND EXCHANGES

- (1) The State Key Laboratory of Mechanical Transmission, Chongqing University, has been undertaken a research entitled 'The power transmission principles and self-oriented control method for heavy-loaded and mutation working condition' which is one of the six work packages of the project 'The fundamental key research of unmanned mining machine working in deep coal mine'. This is a large-scale collaborative research project supported by the China 973 programme and the project contains about 8 research teams including industrial partners. This is a four-year project commencing 2014.
- (2) The chairman of this TC, Professor Daizhong Su of the

Advanced Design and Manufacturing Engineering Centre, Nottingham Trent University, UK, was invited by the China 973 project mentioned above to assess the project progress, Professor Su is the only expert from Overseas in the assessment panel, which was held on 23rd July 2015

- (3) The Advanced Design and Manufacturing Engineering Centre (ADMEC) at Nottingham Trent University has been participating in the myEcoCost project www.myecocost.eu which is supported by the European Commissions' FP7 environment programme grant 2,959,800 Euros (project duration 2012-2015). In collaboration with 8 project consortium members across the EU states, the ADMEC developed an approach to calculate the environmental impact of industrial gearboxes. The outcome is included the paper to be presented at the forthcoming IFToMM Conference in Taipei.

4- CONFERENCE EVENTS

- (1) The International Symposium on the Advanced in Bearing was held at Chongqing, China, 17-19 May, 2015, which was organised by the State Key Laboratory of Mechanical Transmission (SLMT), Chongqing University, China. SLMT is a key member organisation of this TC.
- (2) Third Conference on Mechanisms, Transmissions and Applications (MeTrApp 2015), Aachen, Germany, May 6-8, 2015. This TC supported this conference.

- 5- MOST RELEVANT PUBLICATIONS (no more than 10)
- Yimin Shao and Daizhong Su, Patent 'Gearbox casing Informatics for low-speed gearbox', Patent number 2012-105-28026-4, authorization date: 21st October 2015, China Intellectual Property Bureau.

6- FUTURE PLANNED ACTIVITIES

- (1) The International Conference on Power Transmissions, 27-30 October 2016, Chongqing, China. To be organised by the State Key Laboratory of Mechanical Transmission in collaboration with this TC, the Mechanical Engineering Society of China and the Aeronautical Engineering Society of China.
- (2) The JSME International Conference on Motion and Power Transmissions, March 1 – 3, 2017, Kyoto, Japan
- (3) The next International Symposium on Theory and Practice of Gearing will be held in Cartagena, Spain in 2017.
- (4) Fourth Conference on Mechanisms, Transmissions and Applications (MeTrApp 2017), Trabzon, Turkey, July 3-5, 2017. (MO Turkey, TC Linkages and Mechanical Controls, and TC Gearing and Transmissions)

7- OTHER RELEVANT INFORMATION

Teaching activities

- (1) Gearing and transmission is a fundamental subject in mechanical engineering, and relevant members of this TC are involved in the teaching this subject at their universities as their commitments.

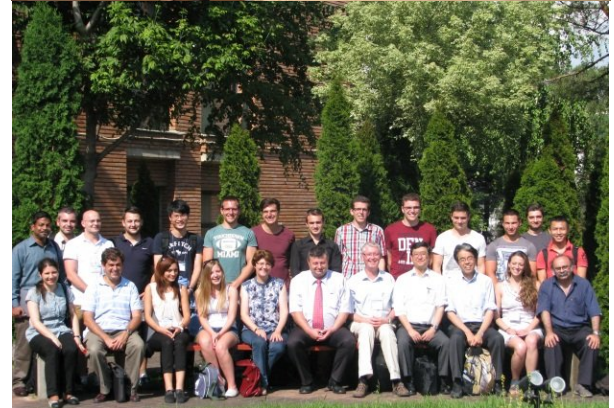
- (2) The approach to calculate the environmental impact of industrial gearbox, which is resulted from the collaborative research project ‘myEcoCost project www.myecocost.eu which is supported by the European Commissions’ FP7 environment, has been utilised in the following teaching programmes
- ‘Applied design and Research’ module of MSc/MA Smart Design and Technology at Nottingham Trent University, UK;
 - ‘Sustainable product design’ as part of an invited lecture to Master course of Industrial Design at Harbin Institute of Technology, China.



8- RELEVANT PHOTOGRAPHS, FLYERS



The TC meeting held on 26th October 2015 in Taipei



Students awarded within the YDP of IFToMM/ Lecturers and students of Summer School 2014

TC LINKAGES AND MECHANICAL CONTROL

Assoc. Prof. PhD. Erwin-Christian Lovasz, University Politehnica Timisoara, Mechanical Engineering Faculty, Mechatronics Department, Mihai Viteazu 1, RO-300222, Timisoara, Romania

Email: erwin.lovasz@upt.ro

TC Webpage: <http://www.mec.upt.ro/tc/>

REPORT OF ACTIVITY: from July 1, 2014 to August 31, 2015

1- DISCUSSION OF RECENT ACTIVITIES

- The first TC Summer School in 2014 in Timisoara, entitled „Micro- and Macro Mechanisms Design in Mechatronics and Robotics”, took place successfully in Timisoara at the Politehnica University between 13-20 July with the participation of 20 students originating from Germany, Italy, Spain, Taiwan, Bulgaria, Romania, Oman, China and a number of 7 lecturers (all IFToMM members). A number of 4 students received a partial grant within the IFToMM Young Delegates Program. The Summer School offered the participants very interesting lectures and a pleasant social program. The organization of the Summer School 2014 received a logistic support from the Politehnica University and covering of the travel expenses from University Shizuoka and University Yamanashi.

- Several selected papers of TC Members were published in the Springer book “Distinguished Figures in Mechanism and Machine Science. Their Contributions and Legacies”. Volume 3.
- The TC Linkages and Mechanical Controls members gave great contribution to the reviewing process of the submitted papers to the 14th IFToMM World Congress. Special thanks for their effort go to the following TC members: prof. Joachim Burkhard Corves, prof. Victor Petuya, assoc. prof. Erwin-Ch. Lovasz, assist. prof. Mehmet Ismet Can Dede, assist. prof. Chin-Hsing Kuo, prof. Mathias Huesing, prof. Hidetsugu Terada, prof. Iosif Tempea, prof. Jaroslav Szrek, prof. Martin Bilek, prof. Antoni Gronowicz, prof. Yan Chen, prof. Domenico Mundo, prof. Giuseppe Quaglia, prof. Wei Lin, dr. Uwe Hanke, prof. Xianmin Zhang, prof. Guido Danieli, prof. Shimin Wie, prof. Yu-Xin Wang, prof. Ioan Doroftei, lect. Dan Margineanu, assoc. prof. Corina Gruescu.

2- MEETINGS AND VISITS

- During the reporting period the TC had 6 meetings on the occasion of different scientific events: The 3rd Asian MMS Conference in Tian Jin (China); The 5th European Conference on Mechanism Science EUCOMES 2014 in Guimarães (Portugal); TMiUM 2014 Conference in Wroclaw (Poland), MeTrApp-2015 (Germany), TrISTOMM-2015 (Turkey) and The 14th IFToMM World Congress (Taiwan).
- Assoc.prof. Erwin-Chr. Lovasz visited RWTH Aachen, Izmir Institute of Technology, National University of

Science and Technology Taipei, and VUTS Liberec. Prof. Burkhard Corves visited University Politehnica Timisoara and Izmir Institute of Technology. Assoc.prof. Victor Petuya visited Politehnica University Timișoara and RWTH Aachen. Asist.prof. Chin Hsing Kuo visited Politehnica University Timișoara and RWTH Aachen.

3- CONFERENCE EVENTS

TC Linkages and Mechanical Controls gave scientific contribution and support to several conferences organized by TC members:

- The XXIVth International Conference on Theory of Machines and Mechatronic Systems, Szklarska Poręba, Poland, Sept. 21-24 2014 – prof. Antoni Gronowicz
- The 3rd Conference on Microactuators and Micromachines, Timisoara, Romania, Oct. 02-04 2014– scientific contribution and support letter – assoc.prof. Erwin-Chr. Lovasz
- The third Conference on Mechanisms, Transmissions and Applications MeTrApp 2015 Aachen, Germany, May 6-8 2015 – prof. Joachim Burkhard Corves
- TriSToMM Symposium on Theory of Machines and Mechanisms, Izmir, Turkey, June 14-17 2015. – assist.prof. Mehmet Ismet Can Dede



Participants at MAMM-2014



Participants at MeTrApp-2015

4- MOST RELEVANT PUBLICATIONS (no more than 10)

1. Corves B., Lovasz E.-Ch., Hüsing M. (Editors); *Mechanisms, Transmissions and Applications: Proceedings of the Third MeTrApp Conference 2015 (Mechanisms and Machine Science)*, Series Mechanisms and Machine Science 31, Springer, 2015, DOI 10.1007/978-3-319-17067-1.
2. Lovasz E.-Ch., Ananthasuresh G. K., Corves B., Petuya V. (Editors); *Microactuators and Micromechanisms. Proceedings of MAMM 2014*, Springer, 2014, Series Mechanisms and Machine Science 30, DOI 10.1007/978-3-319-15862-4.

3. Alizade R., Kiper G., Bagdadioglu B., Dede M. I.; *Function synthesis of Bennett 6R mechanisms using Chebyshev approximation*, Mechanism And Machine Theory, 2014, 81:62–78.
4. Corves B., Brinker J., Lorenz M., Wahle M.; *Design methodology for translational parallel manipulators exhibiting actuation redundancy*, Archive Proceedings of the Institution of Mechanical Engineers, Part C, Journal of Mechanical Engineering Science 1989-1996 (Vols 203-210), 2015.
5. Loizaga M., Altuzzara O., Pinto Ch. Petuya V.; *Control distribution of partially decoupled multi-level manipulators with five DOFs*, Robotica, 2015, 1:1-17.
6. Lovasz E.-Ch., Modler K.-H., Neumann R., Gruescu C. M., Perju D., Ciupe V., and Maniu I.; *Novel Design Solutions for Fishing Reel Mechanisms*, Chinese Journal of Mechanical Engineering, 2015, 28(4), 726-736.
7. Prause I., Eddine S. C., Coreves B.; *Comparison of parallel kinematic machines with three translational degrees of freedom and linear actuation*, Chinese Journal of Mechanical Engineering 28(4):841-850.

5- FUTURE PLANNED ACTIVITIES

- The next TC LMC meetings are intended to be held during
- a. The XIIth Conference on the Theory of Machines and Mechanisms, TMM-2016, Liberec, Czech Republic, 2016.
 - b. The Joint Conference on MTM&Robotics-2016, in Aachen, Germany, 2016.
 - c. The 4th Asian Conference on Mechanisms and Machine Science

TC MICROMACHINES

Prof. Brian Jensen, Brigham Young University

Email: bdjensen@byu.edu

REPORT OF ACTIVITY: from July 1, 2014 to June 30, 2015

1- DISCUSSION OF RECENT ACTIVITIES

The TC on Micromachines sponsored the Micro Actuators and Micro Mechanisms (MAMM 2014) conference in 2-4 Oct. 2014 in Timisoara, Romania. The meeting brought together experts from around the world to present current research, discuss upcoming trends, and share ideas. The conference was a great success.

2- MEETINGS AND VISITS

The committee met as part of MAMM 2014. Plans were made to sponsor the next MAMM conference in 2016.

3- CONFERENCE EVENTS

The Micro Actuators and Micromechanisms Conference (MAMM 2014) was a great success in Timisoara, Romania. The next Micro Actuators and Micromechanisms Conference (MAMM 2016) will be held in Ilmenau, Germany, from 5-7 Oct. 2016.

4- MOST RELEVANT PUBLICATIONS (no more than 10)
E.-C. Lovasz, G. K. Ananthasuresh, B. Corves, and V. Petuya, editors, *Microactuators and Micromechanisms*, Springer, 2015.

5- FUTURE PLANNED ACTIVITIES

After the successful Conferences MAMM- 2010 in Aachen, Germany, MAMM-2012 in Durgapur, India, and MAMM-2014 in Timisoara, Romania, MAMM 2016 will be the 4th Conference on Microactuators and Micromechanisms, being held in Ilmenau, Germany. The aim of the conference is to bring together scientists, industry experts and students and to provide a special opportunity for know-how exchange and collaboration in various disciplines referring to micro systems technology.

TC RELIABILITY

Prof. Zbigniew Keszy; Kazimierz Pulaski University of Technology and Humanities in Radom, Malczewskiego 29, 26- 600 Radom, Poland
Email: zkeszy@interia.pl
TC Webpage: www.iftomm-reliability.strefa.pl

REPORT OF ACTIVITY: from June 2014 to September 2015.

1- DISCUSSION OF RECENT ACTIVITIES

Five problems was discussed last year:

1. The problem connected with “silent” members still exist in the TC for Reliability although **in 2013 two members of the TC were removed**. This year nobody is removing from list of our members, but the issue will return next year.
2. Activity of members is next problem to solved. So far, the most active members are from China, Czech Republic, Russia, USA (alphabetically).
3. Organization of a world conference in reliability area is still in progress. Petersburg in Russia was chosen as a possible place of such conference. This activity is strongly supported by Prof. Dr. Kirill Nikolaevich Voinov, who organizes annually International Conference of Tribology and Reliability in Petersburg. The conference probably will take place in year 2016.
4. Prof. Giuseppe Quaglia (MO Italy Secretary) wanted us to join Prof. Riccardo Rubini (Università degli Studi di Modena e Reggio Emilia – Dipartimento di scienze e metodi dell'ingegneria) as a member of the TC for Reliability. We concurred with his request, because so far one person (Prof. Giorgio Dalpiaz) represents MO Italy in our TC.
5. The last issue is connected with “observer” positions. Now three persons (one from South Africa, two from Sweden) have such position in the TC for Reliability. But the problem is that South Africa and Sweden have not IFToMM Member Organizations.

2- MEETINGS AND VISITS

Meetings and visits were connected with organizing by TC members and taking part in following events:

Prof. Kirill Voinov:

- VIII International meeting in the firm BEE-Petron, St-Petersburg, 2015.

Prof. Zdenek Vintar:

- International Conference on Quality, Reliability, Risk, Maintenance, and Safety Engineering - QR2MSE 2015, July 21-24, 2015, Beijing, China.
- European Safety and Reliability Conference - ESREL 2014, September 14 - 18, 2014, Wroclaw, Poland.
- International Conference on Military Technologies – ICMT 2015, May 20 – 21, 2015, Brno, Czech Republic.
- International Conference on Smart Systems in All Fields of the Life - ICMERA 2014, October 23 - 26, 2014, Bucharest, Romania.
- 4th International Conference on Circuits, System and Simulation - ICCSS 2014, August 17-18, 2014, Nottingham, UK.
- Deterioration, dependability, diagnostics 2012, October, 2014, Brno, Czech Republic.

Prof. Grigory Panovko:

- International Innovation-oriented Conference of Young Scientists (MIKMUS 2014). Moscow, December, 17-19, 2014.
- 13th International Conference of Vibroengineering 2014, Katowice, Poland, 2014.
- 18th International Symposium "Dynamics of vibroimpact (strongly nonlinear) systems". Moscow: IMASH RAS, 2015.

3- RESEARCH COLLABORATION AND EXCHANGES

Polish and Taiwanese researches are applying for Join Research Project titled: "Innovative application of smart fluid in industrial robot gripper". Leaders of the project from both sides are active members of the IFToMM (prof. J-Y Chang is the main organizer of the 14th IFToMM Word Congress and prof. Z. Keszy is Chair of TC for Reliability). Institutions of project partners are Kazimierz Pulaski University of Technology and Humanities in Radom (UTH), Poland and National Tsing Hua University (NTHU), Taiwan. Planned start date of the project is 01.01.2016. The project involves reliability problems.

4- CONFERENCE EVENTS

Examples of conferences activity of TC members are as follows:

Prof. Grigory Panovko:

- 8th European Nonlinear Dynamics Conference “ENOC 2014”, Vienna, Austria, July 6 – 11, 2014. “On the modeling oscillation of technological machines driven by an AC-motor”.
- 10th International Conference on Vibration Engineering and Technology of Machinery. Manchester, UK. September, 9-11, 2014. “Analysis of indirect measurement of cutting forces turning metal cylindrical shells”.

- 18th International Symposium "Dynamics of vibroimpact (strongly nonlinear) systems". Moscow: IMASH RAS - 2015 "About the resonance tuning of transport and technological vibration machines".

Prof. Tunc Aldemir:

- Z. Jankovsky, T. Aldemir, R. Denning, L.-Y. Cheng, M. Yue, "A Software Package for the Assessment of Proliferation Resistance of Nuclear Energy Systems", Proc. PSAM 12, Paper #378, International Association for Probabilistic Safety Assessment and Management, California (June 2014).

- T. Aldemir, "Recent Trends in Nuclear Reactor Safety Assessment and Available Tools", Proc.10th International Topical Meeting on Nuclear Thermal Hydraulics, Operation and Safety (NUTHOS-10), Paper # KL-6, Atomic Energy Society of Japan (December 2014).

Prof. Shan-Tung Tu:

- Shan-Tung Tu, Nuclear Power Plants in China and their Challenges for Long Term and Safe Operation (invited plenary Lecture), Nuclear Technology, November 19–20 2014, Quality Hotel Friends, Stockholm.

- Shan-Tung Tu, Challenges and Opportunities for Structural Health Monitoring under Extreme Conditions (invited plenary lecture), The 2nd International Conference on Structural Health Monitoring and Integrity Management, ICSHMIM2014, September 24–26, Nanjing, China.

- Shan-Tung Tu, Life Prediction, A New Science (Plenary Lecture), International Symposium on Structural Integrity 2014, August 20-24, Lanzhou.

5- MOST RELEVANT PUBLICATIONS

Some examples of the most important papers written by Members of TC for Reliability connected with reliability issue of are:

1. Войнов К.Н., Григорьев А.Ю. Трибология и надёжность. Монография. Санкт-Петербург, Нестор-История, ISBN 978-5-906108-08-1, 2015. - 328 с.
2. Войнов К.Н. Проблемы и решения в вопросах трения изнашивания. Санкт-Петербург, Нестор-История, ISBN 978-5-906108-11-1, 2015. - 500 с.
3. Panovko G., Shokhin A., Eremeykin S. The Control of the Resonant Mode of a Vibrating Machine that is Driven by an Asynchronous Electro Motor, Journal of Machinery Manufacture and Reliability. - 2015, Vol. 44, No. 2. - pp. 109–113.
4. Vierow K., Hogan K., Metzroth K., Aldemir T., Application of Dynamic Probabilistic Risk Assessment Techniques For Uncertainty Quantification In Generation IV Reactors", Progress in Nuclear Energy, 77, 320-326 (2014).
5. Vintř Z. Series System Availability Prediction Using Information on Subsystems Availability. In: Applied Mechanics and Materials, Vol. 656. Pfaffikon: Trans Tech Publications, 2014, p. 597-605. ISBN 978-3-03835-274-7.

6. **M. Migus**, K. Osowski, A. Olszak, A. Kęsy, Z. Kęsy: Computer Aided Design of Mechanical Systems with Regard to Manufacturing Methods Using New Technologies and Materials. Technical Transactions, Mechanics. Issue 1-M (5), 2015, pp. 269 – 276.

6- FUTURE PLANNED ACTIVITIES

The main task for next year of activity are:

- *Organization of the first IFToMM International Conference of Reliability in Petersburg.*
- *Increase in number of the TC for Reliability members.*
- *Improving www site of the TC of Reliability.*

7- OTHER RELEVANT INFORMATION

Prof. Robert M. Parkin moved from Loughborough University to Bedford University, where he has position of Pro-Vice-Chancellor (Research and Knowledge Transfer).

TC ROBOTICS AND MECHATRONICS

Prof. I-Ming Chen Nanyang Technological University, Singapore

Email: michen@ntu.edu.sg

REPORT OF ACTIVITY: from July 1, 2014 to November 30, 2015

1- DISCUSSION OF RECENT ACTIVITIES

ROMANSY 2014 has successfully held in Moscow, Russia in June 2014. ISRM 2015 has successfully held in Poitiers, France in June 2015.

TC sponsored ISRM 2015 was successfully held in Poitiers from June 24-25, 2015. ISRM 2015 received more than 40 papers, and 31 papers were considered suitable for presentation in the Conference. The oral presentations are organized into 7 technical sessions.

2- MEETINGS AND VISITS

One TC meeting was held on 23 June 2014 during Romansy 20 in Moscow, Russia.

During IFToMM World Congress in Taipei, a big TC meeting was held on 27 October 2015 in TICC. There were 24 TC members and 15 other IFToMM members attended the meeting.

3- CONFERENCE EVENTS

The 3rd IFToMM Symposium on Mechanism Design for Robotics MEDER 2015, technically sponsored by TC was held in Aalborg, Denmark from 2-6 June 2015.

The 23rd International Conference on Robotics in Alpe-Adria-Danube Region (RAAD 2014), technically sponsored by the TC was held in Slovakia from 3-5 Sep 2014.

The 3rd Asia MMS, technically sponsored by the TC was held in Tianjin, China from 9 to 10 July 2014.

CLAWAR 2014, technically sponsored by the TC was held in Poznan University of Technology, Poland from 21-23 July 2014.

4- FUTURE PLANNED ACTIVITIES

ROMANSY 2016 will be held in Udine, Italy in June 2016.



TC meeting in IFToMM World Congress 2015, Taipei, Taiwan

TC ROTORDYNAMICS

Prof. Paolo PENNACCHI, Dept. of Mechanical Engineering, Politecnico di Milano, Italy

Email: paolo.pennacchi@polimi.it

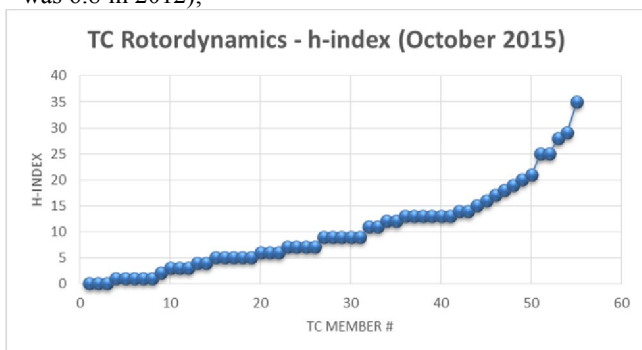
TC Webpage: <http://tcrotodyn.tuwien.ac.at/home/>

REPORT OF ACTIVITY: from July 2014 to October 2015

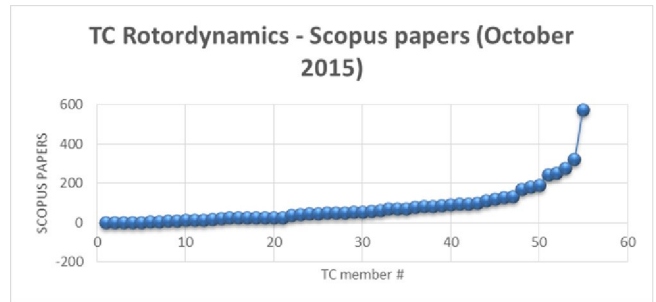
1- DISCUSSION OF RECENT ACTIVITIES

TC members are very active in their publishing activity. In order to give a comprehensive idea and to keep the opportune privacy, here below are reported the number of papers resulting in Scopus and the h-index of the members and the number of cited documents avoiding referring to their names directly.

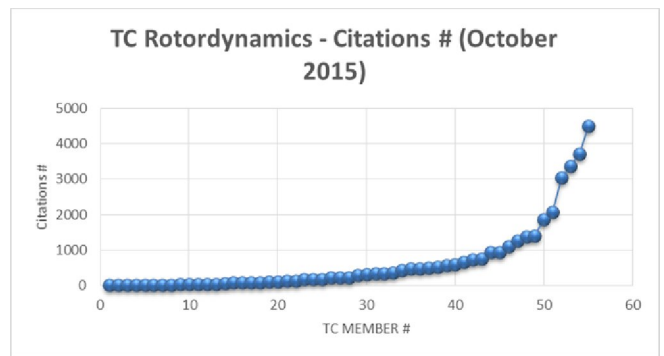
- The average *h*-index is 10 with a median of 9 (average was 6.8 in 2012);



- The average number of papers is 81 with a median of 51 (average was 63.3 in 2012);



- The average number of citations is 636 with a median of 227;



2- MEETINGS AND VISITS

The TC meetings are organized every two years (even years), during the IFToMM Rotor dynamics Conference and the companion conference IMechE VIRM (last 2012). Therefore, the last meeting was during 9th IFToMM International Conference on Rotor Dynamics, September 22-25, 2014, Milan, Italy. There were 21 members attending with additional 9 apologizes. The presentation of the meeting is attached to this document.

3- RESEARCH COLLABORATION AND EXCHANGES

There are several research joint collaborations and exchanges in the Rotor dynamics community. In the frame of EU-Research programs European Universities and companies as well are involved in common research activities.

There have been also exchanges of PhD students and researchers between Italy and Brazil, Germany and Brazil, Greece and Germany, India and Germany, Italy and China, Denmark and Brazil, etc

4- CONFERENCE EVENTS

- 9th IFToMM International Conference on Rotor Dynamics, September 22-25, 2014, Milan, Italy (this is the four-year TC's official conference)

Facts

- Attendees: >250 – 33 countries
- Proposed papers: about 280
- Accepted papers: 198
- Total sponsorship:
- Self fundings: €38.839,00
- Sponsorships: €31.400,00
- 6 best paper awards

5- MOST RELEVANT PUBLICATIONS (no more than 10)
(I'd prefer not to indicate any publication, unless the official proceedings of the last TC conference, in order not to do any preference)

P. Pennacchi (ed.), 2015, *Proceedings of IFToMM - 9th International Conference on Rotor Dynamics*, Mechanisms and Machine Science, Vol. 21, Springer, ISBN 978-3-319-06590-8.

6- FUTURE PLANNED ACTIVITIES

Vibrations in Rotating Machinery – VIRM 11, University Place, University of Manchester, Manchester, 13-15 September 2016

7- RELEVANT PHOTOGRAPHS, FLYERS

Pictures from 9th IFToMM International Conference on Rotor Dynamics



TC SUSTAINABLE ENERGY SYSTEMS

Prof. Dr. Eng. Ion VISA
E-mail: visaion@unitbv.ro

The year we are ending now was dense and involved many TC activities, following the mid- and long-term vision to significantly contribute in the transition towards a novel, clean and affordable energy pattern, implemented at the level of sustainable communities.

Thus, the members of the TC developed R&D projects on sustainable energy systems, among which: FP7 – INCO, ener2i (2013 – 2016, coordinator Sustainable Agency Austria, networking with the European Sustainable Energy Innovation

Alliance, ESEIA); Horizon 2020 BioEnergy Train (BET, coordinator ESEIA); Influence of spectral irradiance on solar energy production (Hungarian Research Fund OTKA, K 84150, 2011-2014); Romanian Cyprus bilateral agreement Clouds Effect on Solar Radiation – Modells, 2014 – 2015; COST Action: Solar-thermal systems in the built environment, TU1205 (2013 – 2017).

The results were disseminated in major scientific events; over 30 papers were published in main stream journals and in conference proceedings. A very special event was the participation in the IFToMM Congress (Taipei, 2015) with five papers; another important and consistent participation was in the World Renewable Energy Congress (Bucharest, 2015) with eight papers.

A book, gathering the experience in research and innovation was published, mirroring the full range of interest of the sustainable energy systems field (Visa I., Jaliu C., Duta A., Neagoie M., Comsit M., Moldovan M., Ciobanu D., Burduhos B., Saulescu R., *The Role of Mechanisms in Sustainable Energy Systems*, Transilvania University Publishing House, 2015).

Didactical activities benefitted on the knowledge gained in the research grants and contracts, through M.Sc. programmes (Solar energy course (in English) at spring semester of 2015, at the Szent Istvan University, Godollo, Hungary; Master Degree Course "Renewable Energy Sources and Technologies", 2014...2015, University of Ruse, Bulgaria; Master Degree: Product Design for Sustainable Development and Environment, 2014 – 2015, Transilvania University of Brasov, and the adequate teaching materials.

Besides a permanent communication among the members, two TC meetings were organized, in Taipei – Taiwan (during the IFToMM congress) and in Ruse – Bulgaria.

These activities show the viability of the complex topics describing the sustainable energy systems concept; further on, 2016 will be the year for extending the project-based work, for increasing visibility and for strengthening the links with the end-users, companies and communities. The activities will also focus on extending the TC team, besides the already active 16 members and 7 observers.

TC TRANSPORTATION MACHINERY

Professor Nong Zhang, University of Technology Sydney
Email: Nong.Zhang@uts.edu.au

TC Webpage:

http://www.iftomm.org/index.php?option=com_iftommembers&view=memberslisting&list=2&tcpc=tc&tit=Technical%20Committees&Itemid=120&comit=Technical_Committee_for_Transportation_Machinery

REPORT OF ACTIVITY: from November 15, 2014 to November 14, 2015

1- DISCUSSION OF RECENT ACTIVITIES

The principal task of 2015 for the TC on Transportation Machinery has been the initiation of renewal of committee members. In early 2015 a call was put forward to existing TC members who were no longer active for the recommendation of alternative representatives. These representatives have been put forward from appropriate Member Organisations. As a result members in South Korea, Japan, Taiwan and India have changed. New members from Italy, USA, UK and China have been recommended by relevant MO and Put forward to the executive for approval.

With the addition of new and active member, along with the continuation of a number of actively engaged existing members, the TC on Transportation Machinery is looking forward to a reinvigorated 2015.

2- CONFERENCE EVENTS

Two papers were presented to the 8th Australian Congress on Applied Mechanics by Prof Zhang, Dr Walker and their post graduate students. This conference was held in Melbourne, Australia (26-28 of November 2014):

1. Ruan, J., Zhang, N. & Walker, P. 2014, 'Comparing of the effects of CVT and DCT on the EVs including braking energy recovery', 8th Australasian Congress on Applied Mechanics, ACAM 2014, as Part of Engineers Australia Convention 2014, pp. 942-950.
 2. Walker, PD, Zhang, N, and Fang, Y. 2014 'Experimental Investigation of Efficiency Losses in a Two
1. University
 2. Dr. Raghavan, "Synthesis of Transmissions with Four Planetary Gearsets", GM R&D
 3. Mr Ruan, Comparing of single reducer and CVT based transmissions on battery electric vehicle", Speed Electric Vehicle', 8th Australasian Congress on Applied Mechanics, ACAM 2014, as Part of Engineers Australia Convention 2014.

The major activity for IFToMM this year is the IFToMM 2015 World Congress. A Session for TC on Transportation Machinery was organized.

As a part of this work the following seven (7) papers will be presented by members of the TC or their colleagues:

3. Prof. Yang, "Optimal Design of a Middle Motor for a Pedal Electric Cycle" National Taiwan University
4. Prof. Pang, "Structural Analysis and Optimized Design of Working Device for Backhoe Hydraulic Excavator", Chongqing University
5. Prof. Huang, "Design of a Novel Solar Air Conditioning System for Electric Vehicles", National Taiwan University of Technology, Sydney
6. Prof. Chen, "On the Mechanism Design of A Dual-Function Bicycle", Far East University
7. Prof. Lozano Guzmán, "A Study of the effect of variations in bogie centre distance on rail car roll performance", CICATA Queretaro Unit

3- MOST RELEVANT PUBLICATIONS (no more than 10)

1. Zhou XX; Walker PD; Zhang N; Zhu, B; Ruan J; 2014

"Numerical and experimental investigation of drag torque in a two-speed dual clutch transmission" Mechanism and Machine Theory, 79 pp. 46-63.

2. Walker PD; Roser HM 2015 "Energy consumption and cost analysis of hybrid electric powertrain configurations for two wheelers" Applied Energy, 146:279-287.

4- FUTURE PLANNED ACTIVITIES

Prof Nong Zhang is planning an International Workshop on New Energy Vehicle Technologies in July - October 2016, this will likely be held in Hefei, China

TC TRIBOLOGY

Prof. Dae-Eun Kim, Yonsei University

Email: kimde@yonsei.ac.kr

TC Webpage:

http://www.iftomm.org/index.php?option=com_iftommembers&view=memberslisting&list=2&tcpc=tc&tit=Technical%20Committees&Itemid=120#Technical_Committee_for_Tribology

REPORT OF ACTIVITY: from July 1, 2014 to November 30, 2015

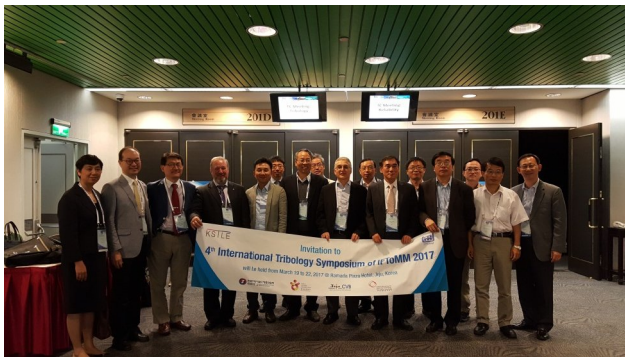
1- DISCUSSION OF RECENT ACTIVITIES

Over the past year, members of the TC for Tribology have actively engaged in various activities to foster and promote the field of tribology. They participated in numerous major international tribology conferences as committee members and also gave several keynote as well as invited talks. In addition, several conferences related to tribology are being planned by the members in the coming year. As for journal publication activity, many papers have been published in major international journals and members have been involved in editorial positions of major journals. There were several cases of collaboration among the members in the way of short and long term visits, signing of memorandum of understanding, invited seminars, etc.

Several of the members participated in the IFToMM 2015 World Congress in Taipei during which plans for next year's activities were discussed. Particularly, the 1st Call for Papers was announced for the 4th International Tribology Symposium of IFToMM (ITS-IFToMM 2017) to be held in conjunction with the 1st K-Tribology Symposium (K-TIS 2017). This event is scheduled to be held in March 2017 in Jeju, South Korea.

Currently, TC for Tribology has 22 members including 1 observer. As for new members for this year, Prof. Alexander Fidlin from Germany was approved.

2- RELEVANT PHOTOGRAPHS, FLYERS etc. record important events and Organization activities



Tribology Technical Committee meeting during 2015 IFToMM World Congress



Tribology Technical Committee dinner during 2015 IFToMM World Congress

4th International Tribology Symposium of IFToMM

(ITS-IFToMM 2017)

&

1st K-Tribology International Symposium

(K-TIS 2017)

March 19 - 22, 2017
Ramada Plaza Hotel, Jeju, Korea

Organized by

The Korean Society of Tribologists & Lubrication Engineers (KSTLE)

IFToMM Technical Committee for Tribology

<http://www.ITS-IFToMM2017.org>

Invitation Message

We are delighted to announce that the 4th International Tribology Symposium of IFToMM (International Federation for the Promotion of Mechanism and Machine Science) (ITS-IFToMM 2017) and the 1st K-Tribology International Symposium (K-TIS 2017) will be held from March 19 to 22, 2017 at the Ramada Plaza Hotel in Jeju, Korea. This will be the 4th ITS-IFToMM followed by the 1st (Beijing, 2008), 2nd (Rio de Janeiro, 2010), and 3rd (Lulea, 2013) ITS-IFToMM. This event will be held together with the 1st K-TIS organized by the Korean Society of Tribologists and Lubrication Engineers (KSTLE). The aim of ITS-IFToMM/K-TIS 2017 is to provide the opportunity for scientists and engineers from all over the world to come together and exchange the latest information on a wide range of topics relevant to tribology. The topics will include all the major themes of tribology and other related fields. We expect ITS-IFToMM/K-TIS 2017 to be exciting and fruitful for all the attendees from academia as well as industry. We invite all of you to participate in this event and we look forward to hosting you in the beautiful island of Jeju in March of 2017.

Sincerely,
Dr. Ung Su Choi, Chair of ITS-IFToMM/K-TIS 2017
Prof. Dae-Eun Kim, Chair of IFToMM Technical Committee for Tribology

Topics

Fundamentals of friction and wear	Tribology of MEMS/NEMS
Contact mechanics	Reliability of machine elements and systems
Boundary lubrication	Tribology of manufacturing processes
Elastohydrodynamic lubrication	Chemical mechanical polishing
Fluid film lubrication	Magnetic recording systems
Lubricants, additives and tribo-chemistry	Automotive tribology
Solid lubrication	Biotribology
Coatings and thin films	Green tribology
Surface modification	Tripo-testing methods
Surface characterization	Condition monitoring
Rolling and journal bearings	Other related topics
Micro/Nano tribology	

Important Dates

- Deadline of 1 or 2-page Extended Abstract submission: Sep 15, 2016
- Notification of acceptance: Nov 15, 2016
- Deadline for revised Extended Abstract submission: Jan 15, 2017
- Deadline for Full Paper submission (optional): Mar 15, 2016

Symposium Venue

The 4th ITS-IFToMM 2017 & 1st K-TIS 2017 will be held at the Ramada Plaza Hotel in Jeju Island located to the south of the Korean peninsula. It is an oval-shaped volcanic island with Halla Mountain (1,950 m) in the center. Jeju Island was designated as a Biosphere Reserve in 2002, World Natural Heritage in 2007 and Global Geopark in 2010, making the sub-tropical island the only place to receive all three UNESCO designations in natural sciences. Jeju has now become a treasure island of environmental assets that the world has to preserve.

Registration

Category	Early Registration (Oct or Before Dec 18, 2016)	Regular Registration (After Dec 18, 2016)
Full Registration (w/ Banquet)	KRW 600,000	KRW 700,000
Student Registration (w/o Banquet)	KRW 300,000	KRW 400,000

Contact Information

Correspondence and Conference Website
Ms. Jae-Jeong Lee
Email : secretary@its-iftomm2017.org
Website : www.ITS-IFToMM2017.org

Sponsored by



1st Call for Paper for 4th International Tribology Symposium of IFToMM & 1st K-Tribology International Symposium

NEWS FROM PERMANENT COMMISSIONS

[A total of 3 reports]

PC COMMUNICATIONS, PUBLICATIONS, ARCHIVING

Prof. Veniamin I. Goldfarb, Institute of Mechanics, Izhevsk State Technical University
Email: veniamingoldfarb@yahoo.com

REPORT OF ACTIVITY: from June 2014 to October 2015

1- DISCUSSION OF RECENT ACTIVITIES

- 1-1. The 2015 IFToMM Newsletter was published. As usual, the Editorial Board headed by prof. Shuo Hung Chang collected annual reports and news from all IFToMM component committees and commissions and other relevant information.
- 1-2. The following changes and updates were done at the IFToMM webpage within the year 2015:
 - 1) The IFToMM Website was currently maintained and updated, various documents were downloaded to different sections of the webpage.
 - 2) The contract (on administrating the IFToMM webpage (during the year 2015) between IFToMM

President and PhD Natalya Barmina was signed. The list of agreed tasks to be completed within this contract is presented in the Annex 1.

- 3) The list of TC/PC/MO members with photos and contact information was updated after EC Annual Meeting in 2014.
 - 4) The Calendar of future congresses, forthcoming and previous conferences, symposia and other events is constantly presented and updated at the IFToMM website.
 - 5) Electronic submission of Annual reports of PC/TC Chairs and Electronic submission of Annual reports of MO Chairs continued operating successfully for the year 2015. It will essentially simplify the work of Secretary General, publication of Newsletters and preparation of all next EC annual meetings. The new page for new annual reports was created for the year 2015 for all MOs, TCs and PCs. All TC/PC/MO chairs were informed about the necessity and procedure of downloading new annual reports. After some report is downloaded, it becomes green colored for better visualization of EC on the progress.
 - 6) The depository of TC/PC/MO annual reports for the year 2014 was created, constantly available to all TC/PC/MO chairs and EC members.
 - 7) All .doc files were replaced by .pdf files at the webpage for easier reading.
 - 8) A separate page section for each PC and TC was created on the Webpage. All TC/PC members were addressed with the request to send documents and other information related to their TC/PC. The administrative group started filling the page sections with documents sent by several TC chairs. When all available information is added, all iftomm members will be provided with corresponding logins and passwords to be able to communicate within their TC/PC.
- 1-3. Publishing activity was related to publication of various IFToMM affiliated journals. More detailed reports on publications for the year 2015 are presented by Chief Editors of these journals.

2- MEETINGS AND VISITS

During the year 2015 PC CPA members held private meetings and made visits on various subjects within the concept of perspective cooperation and publication activities.

3- RESEARCH COLLABORATION AND EXCHANGES

Correspondence between EC members to discuss the proposals on the PC CPA structure and new directions of PC CPA activity.

Correspondence with chief editors of IFToMM affiliated journals on publishing activity and its future prospects.

Correspondence between PC members to discuss the directions of the PC CPA activity.

4- CONFERENCE EVENTS

No separate conference events were held for the year 2015 for PC CPA.

5- MOST RELEVANT PUBLICATIONS (no more than 10)

In 2015 a book was published to honor the 100 anniversary of Prof. Faydor L Litvin, the founder of the modern theory of gearing. By the decision of IFToMM EC Prof. Litvin was awarded in 2014 with IFToMM Awards of Merits. The book was published by Springer publishing house as a contributed volume of papers devoted to the theory and practice of gearing and transmissions and it united more than 20 papers by authors from more than 10 countries: Veniamin Goldfarb, Natalya Barmina (Editors). Theory and Practice of Gearing and Transmissions. In Honor of Professor Faydor L. Litvin, Springer, 2015, IX, 450 p. 279 illus., Hardcover ISBN: 978-3-319-19739-5.

6- FUTURE PLANNED ACTIVITIES

- 6-1. Advancement of IFToMM webpage, creating new useful chapters, development of forum to activate interpersonal communications, to attract young researchers, to raise the publicity of the webpage as the platform to exchange the experience and discuss different issues.
- 6-2. Development of communication activities related to cooperation with industry.
- 6-3. Application of new forms for communications.

PC HISTORY OF MECHANISM AND MACHINE SCIENCE

Professor EGOROVA OLGA VLADIMIROVNA, Moscow Bauman Technical University, Russia
Email: tmm-olgaegorova@yandex.ru (main);
cuba2006@inbox.ru

REPORT OF ACTIVITY: from September 2014 to September 2015

1. Statements for the activity of the TC/PC Chairwoman **Prof. Olga EGOROVA** has been appointed for the term 2014-2017 (possible extension to two terms) and has been approved at the 2013 IFToMM Executive Council.
Deputy Chair is Prof. **Alessandro GASPARETTO, PhD (Italy)**
2. Discussion of recent activities
 - 2.1. In the frame of the Springer series, started during 2007, the last volume edited by **Marco Ceccarelli** entitled Distinguished Figures in Mechanism and Machine Science: Their Contributions and Legacies, Part 3 has been published. The titles of this series and more information can be found on above webpage <http://www.springer.com/gp/book/9789401789462> where several other volumes have been published during the year 2015.
 - 2.2. The participants of the Workshop in Palermo (Italy) that took place on November 21-22, 2013, were invited by Prof. **Francesco Sorge** (Italy) to prepare full length versions

of their papers (6000 – 12000 words) in order to collect them in a book with a title “Technical Advances in Engineering Mechanics from the Antiquity to the Present”. The mentioned book with the editors Giuseppe Genchi and Francesco Sorge within the Springer series is under production now.

2.3. Ten (10) best papers that were presented during the Workshop for the History of MMS (HMMS-2015) that took place on May 26-28, 2015 in St-Petersburg, Russia were selected for publication in a special issue of the Journal “Frontiers of Mechanical Engineering” with Prof.

Alexander Evgrafov (Chair of the Workshop, St Petersburg University), Prof. Olga Egorova (chair of the PC, Bauman University o Moscow), and Marco Ceccarelli (as promoter AE) as guest editors of the issue.

2.4. The papers on History of MMS submitted to the 14th IFToMM 2015 World Congress that will take place on October 25-30, 2015 in Taipei, Taiwan, are planned to be issued as Digital Proceedings which will be Engineering Index (EI), DOI and ISBN numbered. Official language is English.

2.5. All the papers submitted to HMM 2016 International Symposium on History of Machines and Mechanisms that will take place on June 7-10, 2016 **in Queretaro, Mexico, will be collected in one book with Springer series as Proceeding of Symposium.**

3. Meetings and visits

The members and observers of the Permanent Commission for the HMMS attended the following meetings:

3.1. June 26, 2014, **Moscow, Russia**, during IFToMM RoManSy Symposium banquet. The details of plan for the Workshop for the History of MMS in St-Petersburg were discussed;

3.2. July 6, 2014 in Tianjin, China, during the Workshop on the History of Machines and Mechanisms. New candidates (from China and Russia) for the membership were discussed and recommended. The plan for a future activity was discussed and approved;

3.3. May 26-28, 2015 in St-Petersburg, Russia, during the Workshop on the History of Machines and Mechanisms. New candidates (from Japan) for the membership were discussed as well a plan for a future activity. PhD, Prof. Alessandro GASPARETTO (alessandro.gasparetto@uniud.it), Italy, was nominated the Deputy Chair.

3.4. October 26, 2015 in Taipei, Taiwan during IFToMM 2015 World Congress next meeting is planned where new members and observers will be recommended to be appointed;

3.5. June 7-10, 2016 **in Queretaro, Mexico** during HMM 2016 International Symposium on History of Machines and Mechanisms the meeting is planed to be held.

4. Conference events

4.1. "Theory and Practice of Gearing" International Symposium dedicated to the anniversary of the outstanding Gear Expert, founder of the modern Gearing Theory Prof. F. Litvin took place on January 21-23, 2014 in Izhevsk State

Technical University, Izhevsk, Russia, held by TC for Gearing and Transmissions. Members and observers of PC for the HMMS actively participated in the Symposium. The EC Annual Meeting 2014 approved the award of merit for Prof. Faydor F. Litvin.

4.2. Workshop on the History of Machines and Mechanisms took place on July 6, 2014 in Tianjin, China, held with the organization of the member of IFToMM PC for the HMMS and MO China-Beijing PC the History of Mechanism and Machine Science Prof. Jian S. Dai (jian.dai@kcl.ac.uk)

4.3. 2014 IFToMM Asian Conference on Mechanism and Machine Science (IFToMM Asian 2014) including a section devoted to the History of MMS took place on July 09-10, 2014 in Tianjin, China, held with the assistance of the member of IFToMM PC for the HMMS and MO China-Beijing PC the History of Mechanism and Machine Science Prof. Jian S. Dai (jian.dai@kcl.ac.uk)

4.4. 2015 IFToMM PC Workshop for the History of MMS took place on May 26-28, 2015 in St-Petersburg, Russia, held by the organization of Prof. Alexander Evgrafov (observer, St-Petersburg Politechnical Sate University) and by Chair of IFToMM PC for the HMMS Prof. Olga Egorova (tmm-olgaegorova@yandex.ru)

4.5. IFToMM 2015 World Congress will take place on October 25-30, 2015 in Taipei, Taiwan including a section devoted to the History of MMS (www.iftomm2015.tw) with 11 papers

4.6. HMM 2016 International Symposium on History of Machines and Mechanisms is to be held on June 7-10, 2016 in Queretaro, Mexico by the organization of the member of PC on HMM and IFToMM Mexico Prof. Carlos S. Lopez-Cajun (cajun@uaq.mx)

5. Teaching activities

5.1. April 25, 2015, Moscow, Russia, Bauman Moscow State Technical University: Marco Ceccarelli gave a lecture “Past and Future Evolution of Mechanical Engineering” to the students, past-graduates and employees of university;

6. Future planned activities

6.1. The coming soon IFToMM World Congress in 2015 in Taipei, Taiwan, will be a very important event to the IFToMM research community. It is combined with IFToMM General Assembly (GA) and Olga Egorova, PC Chairwoman for the HMMS, will attend the Congress and GA.

6.2. Next PC meeting is planned on October 26, 2015 in Taipei, Taiwan during IFToMM 2015 World Congress where new members and observers will be recommended to be appointed as well;

6.3. HMM 2016 International Symposium on History of Machines and Mechanisms is to be held on June 7-10, 2016 in Queretaro, Mexico by the organization of the member of PC on HMM and IFToMM Mexico Prof. Carlos S. Lopez-Cajun (cajun@uaq.mx)

6.4. Next PC meeting is planned on June 7, 2016 in Queretaro, Mexico during HMM 2016 International Symposium on History of Machines and Mechanisms

7. Other relevant information

REPORT on 2015 IFToMM PC Workshop for the History of MMS, May 26-28, 2015, St-Petersburg, Russia:

- 7.1. 12 countries participants: Netherlands, Italy, Mexico, Brazil, Greece, Korea, Japan, Kazakhstan, Belarus, Russia, China, Taiwan, Mexico;
- 7.2. totally 61 papers were submitted;
- 7.3. total number of participants were 99 (from Russia-55)
- 7.4. 62 participants came to St-Petersburg, Russia to present their papers;
- 7.5. 20 young participants, age 35 years (from Russia-19)
- 7.6. 17 accompanying people (from Russia-13) came to St-Petersburg, Russia
- 7.7. All the programs of scientific presentations including poster’s session as well as the social program were successfully fulfilled.
- 7.8. **Several** letters have been circulated with the aim to invite more participants to present their papers at the Workshop for the History of MMS (HMMS-2015) in St-Petersburg, Russia;
- 7.9. **Several** letters have been circulated with the aim to invite more participants to present their papers at HMM 2016 International Symposium on History of Machines and Mechanisms in Queretaro, Mexico

8. Membership changes

Currently we have 44 members and 16 observers from 25 countries.

Please selected: member	
Name of removed/deleted person:	Retired, more then
Prof. Elisabeth FILEMON	80 years old

PC STANDARDIZATION OF TERMINOLOGY

Prof. Torsten Brix, Technische Universität Ilmenau
 Email: torsten.brix@tu-ilmenau.de
 PC Webpage: www.iftomm.org, www.dmg-lib.org,
 www.iftomm.3me.tudelft.nl

REPORT OF ACTIVITY: from April 2014 to October 2015

1- PRELIMINARY REMARK

The present report gives an overview about the activities and the progress of work of PC and covers the period from April 2014 to October 2015. The activities in this period were mainly focused on the extending and maintenance of the IFToMM dictionary, the integration of the MMS Terminology within DMG-Lib and the development of a web-based work environment for the PC members.

2- MEMBERSHIP

Since middle of 2014 is Torsten Brix the new chair of the PC. He is the successor of Antonius Klein-Breteler, who

implemented and maintain the web access of the IFToMM dictionary. The new Co-Chair of the PC is Ovidiu Antonescu. He was elected unanimously on the 26th October at the PC Meeting during the IFToMM World Congress in Taiwan. The PC has currently 25 members from 17 countries.

3- IFToMM DICTIONARY

The current state of works on the IFToMM dictionary can be found under the web address www.iftomm.3me.tudelft.nl. The website is maintained by Antonius Klein-Breteler. In addition, the chapters 1 to 13 of the dictionary are also available under the web address www.dmg-lib.org (see section 1.3). Changes have been made during the reporting period in the chapters 12, 14, 15 and 16. The following bullet points provide an overview of the status of work on the IFToMM dictionary:

- *Chapter 3: Dynamic*
 During the reporting period a revision should be started according to the activity plan from April 2014. These works have not yet started. The procedure for the revision and responsibilities were discussed on the PC meeting during the IFToMM World Congress 2015. The discussion on this is still not finished.
- *Chapter 12: Gearing*
 In chapter 12 modifications were made (new division in subchapters, improved definition of many terms). These modifications were mainly started from Antonius Klein-Breteler.
- *Chapter 14: Transportation Machinery and Logistics*
 The English version and the Russian version of this chapter are online. A German translation was created during the reporting period by Burkhard Corves and Torsten Brix. A French version does not yet exist, since Didier Remond has left the commission. His successor Jean-Christoph Fauroux was informed about the situation. He will help to organize a translation in French.
- *Chapter 15: Quality Factors/ Quality of Machines and their Components*
 For this chapter there is a draft version in English and Russian made by Victor Starzhinsky and Mark Kane. A publication can probably be expected only after the 26th working meeting next year (see section 3) since a detailed discussion has not yet taken place with the PC members.
- *Chapter 16: Compliant Mechanisms*
 The contents of this chapter were largely drafted by Gerhard Bögelsack. After his death in 2012 Lena Zentner and Nenad Pavlovic have agreed to continue the work. The English version of the Chapters is online. A German and Russian translation are available. The French versions are not available. For these translations we could win Jean-Christoph Fauroux.

4- INTEGRATION OF THE IFToMM DICTIONARY WITHIN DMG-Lib DATABASE

On the 24th Working Meeting of the IFToMM Permanent Commission for Standardization of Terminology in June 2012 in Ilmenau it was decided that the IFToMM dictionary should also be integrated in the DMG-Lib database, in order to support the searching and browsing of content (books, videos etc.). The technical terms with the corresponding definition, links and IFToMM keys are understood as so-called concepts (see ISO 1087-1, Concept: unit of knowledge created by a unique combination of characteristics). In this way the IFToMM dictionary can be used for many applications in the DMG-Lib (translation of websites, thesaurus, multilingual search request etc.). Moreover there is no limit on the number of languages anymore. This also corresponds to the future objective of our EC, that we should consider all languages of the member organizations in our work.

The referred works take place under the direction of Ulf Döring and have been started with the EU-Project thinkMOTION already in the year 2013. Until October 2015 1,614 concepts in 7 languages and over 11,000 translated terms could be taken into account. In October 2015 the status is that the chapters 1 to 13 of the IFToMM dictionary in French, Russian, German and English are totally included in the DMG-Lib database. Romanian is mostly complete. Italian and Spanish are not complete. Chinese, Brazilian and Serbo-Croatian are prepared for the DMG-Lib database. At the moment we have Jean-Christophe Fauroux, Erwin Lovasz, Antonius Klein-Breteler, Burkhard Corves, Ulf Döring and Torsten Brix from the PC involved in this work.

5- WEB-BASED MAINTENANCE OF THE IFToMM DICTIONARY

Works regarding the web-based maintenance of the IFToMM dictionary for PC members started on April 2015 under the responsibility of Benedikt Artelt. The basis for this was a decision made on the 24th Working Meeting in order to make the work of the PC members more efficiently. The following is a brief overview of the previously implemented functionalities.

Generally, the work environment is designed for collaborative work on concepts (see section 4). Therefore, all parts of a concept (technical term and definition in different languages, related concepts, occurrences, IFToMM key number etc.) can be discussed separately. PC members can extend a part of a concept by making a suggestion. Such a suggestion can then be discussed and evaluated. All suggestions and their history become part of a concept. An administrative user can mark them as "preferred" or "hidden" to manage the presentation of the concept in the DMG-Lib portal site. The evaluation and voting of suggestions is important to decide, if the concept can be accepted or not. The access to the concept editing working environment is secured by a login. After the login an overview page is shown with access to tools to find existing concepts or create new ones. There are lists to view the concepts as well as the latest comments, which have been worked on recently. The center part of the working environment is the thesaurus concept editor. It provides an overview of the content of a concept like images, names and

definitions (in different languages), related concepts and occurrences inside the DMG-Lib. All parts can be extended, discussed, evaluated and marked like in the description above. There will be an additional editor for managing IFToMM key numbering. Concepts can be inserted, moved or removed. This will be possible for single concepts or a range of concepts at the same time. All adjustments in the key numbering tree are done automatically. First tests of the work environment will be started in this year.

6- 25th PC WORKING MEETING

The 25th Working Meeting of the PC was held in June 2014 in St. Petersburg. Due to the annexation of the Crimea by Russia in March 2014 and communication problems with the Russian organizers of the 25th Working Meeting there were problems with the visa application for almost all PC members, so that the working meeting took place with only three members. Key activity of this meeting were modifications in chapter 15 (Quality Factors) and 16 (Compliant Mechanisms). These works were crucial prepared by Victor Starzhinsky. Details to the meeting are published under the web address <https://sites.google.com/site/25thworkingmeetingofiftommpca/-draft-minutes-of-the-25th-working-meeting>.

7- PC MEETING DURING THE IFToMM WORLD CONGRESS 2015

The invitation and the proposal for an agenda for the PC meeting during the IFToMM World Congress was prepared and sent to all members in February 2015. Nine members participated in the meeting and discussed issues about the commission activities and the aging of the members. In addition there were two presentations on the meeting. Jean-Christoph Fauroux talked about the results of the EU project thinkMOTION and the use of the IFToMM dictionary within the DMG-Lib for the translation of DMG-Lib webpages and metadata items, the multilingual search, the thesaurus etc. Ulf Döring presented the progress of work on the new work environment for the web-based maintenance of the IFToMM dictionary and showed the ability of current software implementation. The implemented workflow is proposed for validating the additions to the IFToMM dictionary from the suggestion and verification of terms up to the evaluation and voting what should be kept. This workflow is supported by a Wikipedia-like versioning system with considers change logs, comments etc. This is an important base to increase the number of languages, to improve the work of the PC members and to reduce the time of release cycles. Links to other items in the DMG-Lib like images, video or literature help to explain the meaning of terms. Furthermore it gives discussions and decisions about the next working meetings and key activities (see section 8).

8- FUTURE PLANNED ACTIVITIES

The test phase of our new web-based work environment for PC members integrated in the DMG-lib will start in January 2016 (see section 5 and 6). For this purpose, all members will receive login and password in January. This first test phase is scheduled for June 2016. The feedback of the PC

members with respect to the ease of use is required for optimizing the software by Benedikt Artelt.

The 26th working meeting will take place in September 2016 in Bucharest (Romania). Possible subjects are the revision of chapter 3 Dynamics and chapter 16 Compliant Mechanisms, the discussion about chapter 15 Quality Factors and about the experiences with the work environment for the web-based maintenance as well as the IFToMM dictionary in non IFToMM languages. Taking into account the 26th meeting in Bucharest there will be five meetings consecutively in Europe. From this reason the 27th in October 2018 will take place in Asia (China or Taiwan). Some MO chairs will receive in 2016 a letter by the PC to appoint new members for our commission.

The missing translations of chapters 14, 15 and 16 will be done as soon as possible, to make them online accessible (see web sources above). In 2016 there will be a central web based document server for collecting and sharing documents within the PC via www.dmg-lib.org.

Brief Report, 2015 IFToMM WORLD CONGRESS, Taipei, Taiwan



Shuo Hung Chang
Chair, 2015 IFToMM World Congress, Taipei, Taiwan

GENERAL CHAIR MESSAGE

With your strong support and active participation, 2015 IFToMM World Congress held from October 25 to October 30, 2015 in Taipei International Convention Center, Taiwan was extremely successful!

On behalf of the Organizing Committee of 2015 IFToMM World Congress, I am very grateful to the IFToMM Committees and all the participants, members and young scientists; their collective involvements in contributing to the success of 2015 IFToMM World Congress. We received a total submission of 610 papers. After the review, a total of 522 papers, from 45 countries/regions were presented. We have 10 parallel sessions every day with a total of 78 technical sessions and 2 poster sessions. Registrations are from 45 countries/regions, among them, there are 4 countries are not current iftomm member organization.

ISBN Number will be assigned to the proceedings, as well as DOI number. After the congress, we will apply both the Engineering Index and ISI Conference Proceedings Citation Index.

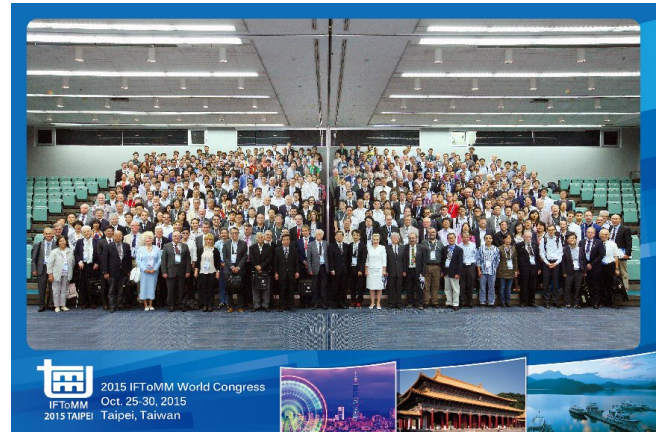
With the trends of machine science moving toward interdisciplinary, the 2015 IFToMM World Congress invited

5 keynote speakers, Prof. Chih-Ming Ho, Dr. Hong-Sen Yan, Prof. Masayuki Inaba, Prof. Feng Gao, and Prof. Andrés Kecskeméthy, to share their perspectives and experiences for the future to biological engineering, especially ultra-precision manufacturing and highly challenging robotics mechanism.

I would therefore like to reiterate my thanks to your significant contribution and truly hope to see you on the next quadrennial IFToMM World Congress to be held in Poland on 2019!

Prof. Shuo Hung Chang

IFToMM 2015 World Congress General Chair
IFToMM Executive Council Member (2012-Present)
IFToMM Vice President (2016-2019)
Distinguished Professor, National Taiwan University
Executive Vice President, Industrial Technology Research Institute



IFToMM BODIES AND CONTACTS

General Assembly

The General Assembly is the supreme body of the Federation and determines its policy. It is composed of the Chief Delegates of IFToMM Organization Members and members of the Executive Council.

Executive Council

The Executive Council manages the affairs of the Federation between the sessions of the General Assembly. It is elected every four years, meets annually, and is composed of the President, Vice-President, Secretary-General, Treasurer, and six ordinary members.

Commissions and Committees

Each Permanent Commission and Technical Committee is composed of a Chairperson, appointed by the Executive Council, a Secretary and members, nominated by the Chairperson and appointed by the Executive Council. A Chairperson shall not serve for more than two terms consecutively. The general goals for the work of the Commissions and Committees are aimed at promoting their fields of interest by attracting researchers and practitioners, including young individuals, in order to:

- define new directions in research and development within their technical areas;
- establish contacts between researchers and engineers;
- initiate and develop bases and procedures for modern problems;
- promote the exchange of information;
- organize national and international symposia, conferences, summer schools, and meetings.

Mission:

To promote research and development in the field of Machines and Mechanisms by theoretical and experimental methods, along with their practical applications

Vision:

To provide leadership for cooperation and development of modern results in the Mechanism and Machine Sciences by assisting and enhancing international collaboration.

For chairs contact address, please look at the IFToMM web page:

• Executive Council (2008-2011):

Marco Ceccarelli (Italy) – President

Yoshihiko Nakamura (Japan) – Vice President

Carlos S. Lopez Cajùn (Mexico) – Secretary General

Joseph Rooney (UK) – Treasurer

Datong Qin (China-Beijing)

Veniamin I. Goldfarb (Russia)

Theodor G. Ionescu (Romania)

Bahram Ravani (USA)

James Trevelyan (Australia)

Miroslav Václavík (Czech Republic)

Past-President: Kenneth J. Waldron (USA)

• Executive Council (2012-2015):

Yoshihiko Nakamura (Japan) – President

Veniamin I. Goldfarb (Russia) – Vice President

Teresa Zielinska (Poland) – Secretary General

Just Herder (Netherlands) – Treasurer

Shuo Hung Chang (China-Taipei)

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