

**EDITORIAL**

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## Special issue on the 9th German–Greek–Polish Symposium on recent advances in mechanics

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Dear Readers:

We are pleased to present to you a special issue of the Archive of Applied Mechanics (AAM) entirely devoted to the scientific results of the *9th German–Greek–Polish Symposium on Recent Advances in Mechanics*. The conference was held 4–9 September 2016 in Kolympari, Greece, on the beautiful Island of Crete, (<http://9ggp.tuc.gr/>). The present issue includes invited articles based on the original contributions to the 9th G–G–P Symposium and developed further to publication standards in AAM.

The first German–Greek–Polish Symposium under the title “Recent Advances in Mechanics” (GGPS) was organised in September 1991 in Pułtusk, Poland, as an international trilateral scientific forum aimed at discussing research studies and projects in mechanics, being in progress in the three countries and having prospects for future developments, international cooperations and industrial applications. The first symposium was initiated by the three eminent scientists from Germany, Greece and Poland:

- Oscar H. Mahrenholtz, professor at TU Hamburg–Harburg, Germany,
- Anthony Kounadis, professor at National Technical University of Athens, Greece,
- Roman S. Bogacz, professor at Institute of Fundamental Technological Research, Polish Academy of Sciences, Poland.

Having outstanding research achievements and international recognition, the initiators presented an attractive common vision of research collaboration for new technologies and progress in Europe after political transformations in the eastern countries. From the present perspective of the year 2017, we realise that the GGPS was a small but important step towards peaceful, friendly and effective European academic cooperation, prior to the European Research Area, the European University Association and other integrating projects.

The initiators who became the first three co-chairmen of the GGPS introduced the basic standards of the conference which are in use still:

- formula of a symposium—invited participants only, 15 from each partner country,
- core of distinguished scientists and recommended invited young researchers,
- presentations of high-level research contributions in form of comprehensive lectures with discussion,
- organisation in Poland, Germany and Greece, successively, every three years (except the first two meetings), by a research/academic institution responsible for the funds,

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- post-conference publications in a prestigious journal.

Since its origin, the GGPS has been recognised and favourably aided by the three research associations in the partner countries:

International Association of Applied Mathematics and Mechanics (GAMM),  
Hellenic Society of Theoretical and Applied Mechanics (HSTAM) and  
Polish Society of Theoretical and Applied Mechanics (PTMTS).

It should be underlined that the GGPS had its own positive role in establishing the Polish Congress of Mechanics. After the successful organisation of ICTAM 2004 at Warsaw University of Technology, Poland, an idea of a new Polish Congress on Mechanics appeared, as an initiative of the Polish Society of Theoretical and Applied Mechanics. The early concept was first discussed with the German and Greek colleagues at the 5th GGPS 2004 in Bad Honnef, Germany, receiving encouragement and advice. The first Polish Congress of Mechanics was organised in 2007 in Warsaw. The third one in Gdańsk (2015) reached the level of a fully international meeting attended by a few hundreds of scientists from numerous countries all around the world.

The last 9th GGPS was organised by the Technical University of Crete and locally hosted by the Orthodox Academy of Crete at Kolympari where the participants found excellent conditions for work and exchange, and experienced the unique Cretan atmosphere and hospitality.

This special issue of Archive of Applied Mechanics contains 19 articles based on the 9th GGPS presentations—first discussed during the conference and then reviewed after individual submissions for publication in AAM. The papers can be divided into the following thematic groups reflecting the main research activities within the GGPS:

- Principles of mechanics and novel formulations via fractional calculus,
- Stability of systems and structures,
- Mechanics of materials,
- Dynamics of railway vehicles and infrastructure,
- Theories of beams and plates,
- Protection of structures against earthquakes,
- Biomechanics,
- Experimental mechanics,
- Miscellaneous (fracture mechanics, under-actuated systems, identification of microstructures, detection of defects in gears etc).

The 9th GGPS was the last in the third complete cycle of symposia in Germany, Greece and Poland. In a round table discussion, the 9th GGPS and the whole series of symposia was found worthy to be continued with its original formula and standards. Thus, the 10th GGPS 2019 will be organised in Poland by Poznań University of Technology.

After 18 years of our mission, we were pleased and satisfied to pass the general chairmanship of the GGPS on to the following scientists, well recognised and accepted by the GGPS community:

- Prof. Stefan Hartmann, Clausthal University of Technology, Germany,
- Prof. Georgios Stavroulakis, Technical University of Crete, Greece,
- Prof. Tomasz Łodygowski, Poznań University of Technology, Poland.

We would like to thank all the participants of the 9th GGPS for their valuable contributions to the symposium increasing its cumulative achievement. We also express our deep appreciation to the local organising institutions—Hellenic Society of Theoretical and Applied Mechanics and Technical University of Crete for all their efforts to make the symposium well prepared and enjoyable. We wish the new co-chairmen much success in organising future GGPS.

Co-chairmen of German–Greek–Polish Symposium 1998–2016:  
John Katsikadelis, National Technical University of Athens, Greece  
Reinhold Kienzler, University of Bremen, Germany  
Włodzimierz Kurnik, Warsaw University of Technology, Poland