Welcome to the 2018 Symposium

Computers, Modelling and Interactive Environments in Science, Technology, Engineering and Mathematics Education

At the ICNAAM 2018, International Conference of Numerical Analysis and Applied Mathematics

Rhodes, Greece, 13 – 18 September 2018

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The development of knowledge following contemporary activities in science, technology, engineering and mathematics (STEM) involves epistemologies and cognition frames associated with modelling processes that balance different elements from theory, experimentation and scientific computation. In addition, many such processes increasingly require advanced mathematical physics models and methods of scientific computation. It then follows that STEM educational curricula, methodologies and teaching-learning environments should envision the development of meaningful learning paths going through balanced interactive explorations of all the different phases of the modelling cycle, namely, qualitative contextual description, definition, exploration, interpretation and validation of mathematical models, communication of results and generalizations. Furthermore, and always taking into account specific area dependent contexts, it is fundamental to achieve an early balanced integration of computational modelling, and to bring up a strong integrated background in physics, mathematics and scientific computation. However, in spite of the increasing amount of scientific evidence accumulated over the years, the majority of current practices in STEM education courses are still not able to reflect such balanced STEM epistemological and cognitive characteristics. Moreover, these are courses that often have many students with fragmented knowledge states, deteriorating expectations and low exam success rates.

This Symposium aims to bring together researchers and educators interested in discussing contributions to improve on this situation. Focusing on secondary and introductory university levels we welcome theoretical, empirical or innovation development contributions distributed by all STEM areas and applications. Topics include but are not limited to:

- STEM knowledge development and modelling paths.
- Conceptual understanding, mathematical reasoning and problem solving capabilities.
- New approaches, curricula or learning-teaching sequences.
- Interactive learning-teaching environments.
- ICT, multimedia and scientific computation.
- Teacher training and professional development.

This Symposium is a part of the 16th International Conference of Numerical Analysis and Applied Mathematics 2018 (ICNAAM 2018), which will be held in Rhodes, Greece, at the Sheraton Hotel, on September 13-18, 2018. See the Conference webpage at http://www.icnaam.org/. Paper manuscripts should be submitted only to the Symposium Organizer at rneves@autonoma.pt or rgn@fct.unl.pt. Submitted manuscripts should be in AIP (American Institute of Physics) format and should not exceed 4 pages. Please read carefully the paper preparation guidelines at http://www.icnaam.org/abstract.htm and submit your contribution with scanned copies of the Submission Form and of the Transfer of Copyright Form no later than July 13, 2018. All accepted papers will be published in the ICNAAM 2018 Proceedings in the AIP Conference Proceedings Series which have been indexed, for example, in ISI Proceedings, Zentrablatt fur Mathematik, MathSciNet, Scopus, Inspec, Scirus and Google Scholar. Acceptance notices will be scheduled for July 20, 2018. After the Conference, selected papers may be extended for submission to the following journals: Journal of Numerical Analysis, Industrial and Applied Mathematics (JNAIAM); Mathematical Methods in the Applied Sciences (Wiley); Applied Mathematics & Information Sciences (AMIS); and Journal of Computational Methods in Sciences and Engineering (JCMSE).