



# Working group

## REASONING AND PROVING WITH TOOL SUPPORT

**Filip Marić**  
University of Belgrade

**Walther Neuper**  
Graz University of Technology

This working group on education is triggered by technological innovation: While Computer Algebra Systems (CAS) and Dynamic Geometry Systems (DGS), accompanied by Spreadsheets, provide general support for mathematics education since decades, Computer Theorem Provers (TP) only recently show impact on mathematics to the public, for instance in proofs like the one for the Kepler Conjecture.

Impact of TP technology on education will be addressed by at least two keynote speakers of CADGME 2014: reasoning and proving can expect specific support by digital tools. Such tools are becoming available for formula-based mathematics as well as for geometry. For instance, leading DGS already experiment with integration of TP technology.

This working group is open for contributions to the topic "Reasoning and Proving with Tool Support" in a wide range. From the side of education, for the range in

- content between intuitive argumentation (for instance in geometry) and rigorous formal proof,
- learners' ages between early mathematics education and academic courses,
- abstraction between detailed examples and general didactic considerations,
- acceptance between "no machines for reasoning!" and enthusiasm for new promises in math education,
- automation between "Interactive TP" and "Automated TP".

From the side of technology, most occurrences of "digital tool" in CADGME's topics (<http://cadgme2014.ceremat.org/topics>) can be substituted by "TP-based system" (TPS) and add new questions to all groups of topics:

- Teaching e.g. transfer authoring of TPS to teachers?
- Learning e.g. improve usability of TPS?
- Curriculum e.g. continuous support from high-school to academic math by TPS?
- Assessment also on reasoning, with TPS?

This working group builds on the tradition of the last CADGME conferences and was initiated for CADGME 2009 in Hagenberg/Linz.