

## FROM THE POWER OF INTUITION TO THE BEAUTY OF ABSTRACTION

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### Short description of the Workshop Groups: organizers, aims and underlying ideas

Contrary to the fact that mathematics many ideas, beauty and inspiration are hidden within simple and intuitive patterns, which are easily noticed and 'intuitively understood', mathematics is considered very abstract. Therefore, the motivation for mathematics teaching and learning should be intuitive and the beauty of abstraction will rise from there.

The main aim of the workshop is to challenge our sensibility for the importance of the intuitive in mathematics teaching and learning. Participants will be challenged by smartly chosen hands-on (and eyes-on) problems. Like some 'graphic puzzles', which are understood in seconds, but are often harder to formulate than to solve. Through examples participants will explore how understanding, motivation and challenge often lie within intuitive comprehension and how abstraction (especially on the primary level) only follows later.

Throughout the workshop participants will be challenged to develop critical and creative approach to technology use. Several samples of exemplary GeoGebra use will be given. Cases where critical teachers will uncover weak or even counter-productive IT use and content neglect will also be considered. Workshop will be a challenge and a true hands-on and minds-on activity with many opportunities for participants to challenge their reasoning and intuition.

For better imagination of what will be happening in this workshop, participants are invited to explore some interactive applets through especially prepared web page at <http://ko.fmf.uni-lj.si/ICME-14/> and through interactive GeoGebra The Beauty of Geometry at <https://www.geogebra.org/m/yknjxne>.

Damjan Kobal has been a devoted teacher at high school and university level and a leading Slovenian educator for (high school) mathematics teachers. He has taught (elementary) geometry, didactics of mathematics and numerous other (teaching related) mathematical courses. For many years he has been the leader of traditional seminars for mathematics teachers and frequent lecturer for teachers and students of all ages. He is an expert in the use of modern dynamic geometry software. For example, he was an invited plenary speaker at the first international GeoGebra conference in Hagenberg, Austria, 2009 and has lectured on many international conferences and was hosted at many educational institutions from USA to India.

### Planned structure:

Planned timeline	Planned activity	Working format /Responsible person
10 min	Introduction	Presentation – discussion / Kobal
70 min	Eyes-on problem solving	Dynamic exploration / Kobal
10 min	Sum it up and feed back	Discussion / Kobal

### Venue requirement:

Workshop will be conducted on-line.

Participants would preferably have simultaneous access to Zoom session, to web browser and to GeoGebra application on their computer to get the most out of guided interactive explorations.