

# IMAGINARY CONFERENCE 2018

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## IC18 Workshop Program

The IC18 workshops run in parallel. Participants work in small groups of up to 15 people to jointly create and implement ideas, prototypes, concepts, exhibits, etc. It is important that you are present during the whole workshop (about 10-12 hours in total). The results of each workshop will be presented on the last day of the conference to all participants.

## Workshop 1

# Live Coding, hands on workshop

Workshop leader: Vitor Rolla

In this workshop mathematics and science educators, students, and researchers jointly explore the use of live coding as a mean to show how mathematical logic and formal structures of computer algorithms produce aesthetically pleasant music and sounds to a broad audience.

Live coding, programming audio and music in real time in front of an audience, is a new kind of artistic performance that is strongly tied to mathematics and computer science. The projection of the code to the audience allows the understanding of the music, and for this reason, the act of live coding becomes a powerful tool for the learning process. The group will produce a collective live coding performance to be exhibited to the whole conference participants

## Workshop 2

# Designing an open explorable medium for mathematics

Workshop Leaders: Ben Hambrecht & Philipp Legner

In most educational software for mathematics, there is a fundamental trade-off between, on the one hand, power and flexibility (allowing users to “explore” and try out new ideas), and ease of use on the other (allowing users to focus on the underlying mathematics, rather than specific implementation details).

In this workshop, we want to brainstorm ideas and create UX prototypes for a “Magic Canvas”: an explorable medium that allows for open play with interconnected mathematical objects. We welcome mathematicians, educators, designers and developers to share and develop ideas together. Programming skills are not required, only strong opinions on what makes great math-ed software.

### Workshop 3

## **A global web portal for math puzzles**

Workshop Leader: Holger Dambeck

Popularization of mathematics needs many different approaches. One possibility are intelligent puzzles that stimulate creativity and mathematical thinking. I started the “Puzzle of the week” in 2014. Between 50.000 and 200.000 readers try to solve it every week. It’s a huge success. And it could be a world wide success story if the puzzles were published on an open global website in different languages.

Participants will try to concretely plan such a portal. What kind of puzzles would fit? How challenging the puzzles should be/can be? Does such a portal need an app? How to develop/invent new puzzles? Do we need columns/categories like (Sam) Loyd of the week, Gardner classics etc.? How to market and finance the portal? Invited are all math puzzle specialists, coders, designer, social media experts and everybody interested.

### Workshop 4

## **Visualisation of Mathematical Ideas for Sightless Students**

Workshop Leader: Evgeniy Shiryayev

Participants of the workshop will develop equipment (mechanisms, exhibits, demonstrational models, etc) to supply a course for sightless students. It is a challenge since success criteria are not evident and the only way to test our result is to give lessons using developed equipment.

We will start modifying known demonstrative models. Perhaps some of them will require to develop auxiliary items. This will be up to our solution.

One or several topics can be chosen for the workshop (equal to number of small groups if more than one).

## Workshop 5

# **Developing a Guideline for Organizing Mathematics Workshops by Creating a Best Practice Example on "Polyhedra and Music".**

Workshop Leaders: Milena Damrau & Anna Maria Hartkopf

What are the ingredients for a successful mathematics workshop? And how can we determine success?

During this workshop we aim to address these questions as we are developing a workshop on the subject of "polyhedra and music". Parallel to this particular endeavour we want to establish a reflection level that uses the tool of journaling to depict the challenges, important aspects, difficulties and phases of the organization process. This reflection process will lead to a guideline for successful mathematics workshops. The twofold goal of the workshop is a thought-out and applicable workshop and this guideline.

## Workshop 6

# **The Math of Machine Learning**

Workshop Leader: to be announced

Machine Learning algorithms (under different names) are a hot topic in the scientific community, and of course, there's a lot of math behind it.

In this workshop, we will try to generate content for showing the basic principles of functioning for these methods. The output could be ideas or prototypes for explanation texts or posters, software based exhibit, board games, workshop concepts, museum installations, robot experiments, or any new format.