

# IMAGINARY CONFERENCE 2018

## Conference Program

**(preliminary)**

Version: October 29, 2018

Find the latest version of this document at [ic18.imaginary.org](http://ic18.imaginary.org)

# Conference Schedule

## Wednesday

9:00	Registration
9:30	Opening
10:00	INVITED SPEAKER Grant Sanderson (3blue1brown)
10:30	Coffee Break
11:00	Moritz Summermann
11:20	Vyasastry Sastry
11:40	Asla Sá
12:00	Karina Ocana
12:20	Lunch Break
14:00	Santiago Laplagne
14:20	Parallel Workshops
	Coffee Break
19:30	Dinner Break

## Thursday

9:00	INVITED SPEAKER Henry Segerman
9:30	Aaron Montag
9:50	Danielle Brake
10:10	Coffee Break
10:40	Tatjana Stanković & Radica Karović
11:00	Federico Holik & M. Laura Rodriguez
11:20	Alejandro Baranek & Leonardo Belen
11:40	Ana Paula Madrid
12:00	Lunch Break
13:40	Aubin Arroyo
14:00	Parallel Workshops
	Coffee Break
19:00	Round Table & IMAGINARY Documentary Projection
	Toast

## Friday

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9:00	INVITED SPEAKER Ingrid Daubechies
9:30	INVITED TALK Plan Ceibal
10:00	Oliver Labs
10:20	Coffee Break
10:50	Thomas Crawford
11:15	Demian Nahuel Goos
11:40	Mariana Haim
12:00	Lunch Break
13:40	Session What's new in the IMAGINARY Universe (Betül Tanbay, Andreas Matt, Bianca Violet, Milena Damrau, Rejoyce Gavhi-Molefe, Ana Machado, ...)
15:25	Parallel Workshops
	Coffee Break
20:00	Conference Dinner

## Saturday

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9:00	Parallel Workshops
10:00	Workshops Presentations
	Coffee Break
13:00	End

# Invited speakers

## Ingrid Daubechies

Ingrid Daubechies is a distinguished mathematician and full Professor in the Department of Mathematics, Duke University. She is best known for her work with wavelets.

Daubechies was the first woman to be president of the International Mathematical Union, and recently received the 2018 William Benter Prize in Applied Mathematics, among several awards.

[math.duke.edu/people/ingrid-daubechies](http://math.duke.edu/people/ingrid-daubechies)

## Henry Segerman

Henry Segerman is a mathematician and mathematical artist, based at the Department of Mathematics at Oklahoma State University. His research is in three-dimensional geometry and topology, and in mathematical visualization. As an artist he works mostly in 3D printed sculpture, with other interests in virtual reality, procedural generation, self-reference, ambigrams and puzzles.

[segerman.org](http://segerman.org)

## Grant Sanderson (3blue1brown)

Grant Sanderson studied math at Stanford, worked as a content creator for Khan Academy for a couple of years, and he is now fully dedicated to his project 3blue1brown, where he uses his own python library to animate his videos.

[3blue1brown.com](http://3blue1brown.com)

## Plan Ceibal

TBA

More speakers to be announced soon!

# List of talks

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Moritz Summermann University of Cologne, Germany	Drawing Topology
Thomas Crawford University of Oxford, UK	The Maths of Media Social
Demian Nahuel Goos Facultad de Ciencias Exactas, Ingeniería y Agrimensura Rosario, Argentina	Connecting teaching techniques of German as a foreign language with a mathematics course
Asla Sá Escola de Matemática Aplicada, FGV, Rio de Janeiro, Brasil	Constellations and Tessellations of Regular Polygons.
Ana Paula Madrid UNICEN University Campus, Tandil, Argentina	entusiasMATE = mathematics and communication. Experiences and questions
Mariana Haim Universidad de la República, Uruguay	The maths behind Dobble card game
Dorcas Addo (TBC) Kwame Nkrumah University of Science and Technology, Ghana	Mathematics and Technology
Oliver Labs MO-Labs, Germany	Creating mathematical 3d objects from equations
Tatjana Stanković Radica Karović University of Belgrade, Serbia	Quiz “The Bridge of Mathematics” - mathematical competition with a cross curricular approach
Santiago Laplagne Universidad de Buenos Aires, Argentina	Britney, interactive fractals
Danielle Brake University of Wisconsin, USA	Printing the entire Herwig Hauser Gallery of Algebraic Surfaces into 3d, with singularities
Karina Ocana CINVESTAV-IPN, Mexico	Powerful Mathematical Ideas Through an Interactive Exhibit

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Federico Holik, M. Laura Rodriguez Instituto de Física La Plata, Argentina	How to explain the notion quantum probability to the general public?
Vyasasastry Sastry Maths communicator, India	Ramanujan Math Park: a new approach to take mathematics to people
Alejandro Baranek Leonardo Belen Maths communicators, Argentina	RPolyhedra: Experiences and beyond
Ekaterina Eremenko (TBC) Technical University of Berlin, Germany	Searching for new formats of popularizing mathematics and mathematicians
Aaron Montag Technische Universität München, Germany	Rapid creation of GPU accelerated mathematical content

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# 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 Shiryaev

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.