

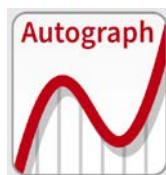
Teaching Mathematics at International Schools

ISMTF/Scholastics International conference

23-25 February 2018

University of Vienna /Mathematics Faculty

With thanks to our sponsors: CASIO ▪ HP ▪ AUTOGRAPH



Program

Friday 23 February		Friday: A sessions in Room A B sessions in Room B	
Session #	Time	A	B
	8:00-8:15	Registration & conference introduction	
Fri-1	8:15-9:30	Keynote - 1 Fri	
	9:30-9:40	Short break	
Fri-2	9:40-11:00	Jim Nakamoto – 2A Fri	Mike Wakeford – 2B Fri
	11:00-11:20	Coffee break	
Fri-3	11:20-12:40	Mehdi Ben Shaaban – 3A Fri	Douglas Butler – 3B Fri
	12:40-1:40	lunch	
Fri-4	1:40-3:00	Pieter Schadron – 4A Fri	I Wazir/J Nakamoto – 4B Fri
	3:00-3:15	Short break	
Fri-5	3:15-4:35	Ruth Eichholtz – 5A Fri	Jim Nakamoto– 5B Fri
	4:35-4:45	announcements	

Saturday 24 February		A	B
Sat-1	8:15-9:35	Douglas Butler – 1A Sat	Tim Garry – 1B Sat
	9:35-9:45	Short break	
Sat-2	9:45-11:05	Mike Wakeford – 2A Sat	RuthEichholtz – 2B Sat
	11:05-11:25	Coffee break	
Sat-3	11:25-12:45	Noritzsch/Palovaara – 3A Sat	Pieter Schadron – 3B Sat
	12:45-1:45	lunch	
Sat-4	1:45-3:00	Tim Garry – 4A Sat	Douglas Butler – 4B Sat
	3:00-3:15	Short break	
Sat-5	3:15-4:35	I Wazir/T Garry – 5A Sat	Mehdi Ben Shaaban – 5B Sat
	4:35-4:45	announcements	

Sunday 25 February		A	B
Sun-1	8:30-9:45	Tim Garry/R	Jim Nakamoto/R
	9:45-10:00	break	
Sun-2	10:00-11:00	panel: IB maths curriculum review	Mike Wakeford/R
	11:10-11:30	closing session	

► **Session Details** session details on following pages >>>

◆ Friday 23 February ◆

Keynote: Prof. Harald Grobner – 1 Fri From triangles to the edge of research in number theory (75 min)

Which integers are the area of a right triangle with rational sides? Starting from such simple questions (going back to Fermat) about triangles, we will present an overview of some of the most exciting fields of modern, number theory research. En passant, we will see how our question on rational, right triangles led to a proof of Fermat's Last Theorem. (Nothing more complicated than a Taylor series in one variable will be required to follow the talk.)

Jim Nakamoto – 2A Fri IA moderation updates (80 min)

IB – DP: Explorations have been moderated online as of the November 2016 examination session. Some helpful advice will be offered in facilitating the submission of samples for moderation.

Mike Wakeford – 2B Fri AUTOGRAPH 4 in the middle school (80 min)

This session will focus on how the Autograph 4 environment can be put to work to support conceptual development of topics and themes in middle school and pre-Diploma curricula.

Mehdi Ben Shaaban – 3A Fri Modelling real life problems in the middle and high school (80 min)

In the age of fast technology that provides immediate answers, it seems difficult for students to value patient problem solving. One solution is to involve them in their construction of meaning by exposing them to real life problems from the world that surrounds them. Asking the question: what problems are people facing everyday and which of those can be solved using mathematics?, this session will offer a range of examples and tools that allow for Mathematical Modeling to be an engaging activity that accelerates students' engagement and learning.

Douglas Butler – 3B Fri Finding and analysing good data sets on the web (80 min)

A workshop taking a look at data sets that are available on the TSM Resources website, all downloadable in Excel format for easy analysis in Autograph or Geogebra.

We will look at a variety of sources, including generating your own data, and include some effective lesson plans for understanding the basic principles of linear regression and residuals.

Pieter Schadron – 4A Fri Reshaping the way we teach mathematics (80 min)

Pieter Schadron from HP will show you how graphing calculators and software can be used to help students visualize and understand maths in the 21st century. Fully adapted to IB Diploma Programme.

Ibrahim Wazir/Jim Nakamoto – 4B Fri New IB Math Syllabus (80 min)

The session will share a detailed overview and discussion using officially published material. What is new in content, what is new in form, and what is not so new.

Ruth Eichholtz– 5A Fri Approaches to Teaching Mathematics: Design Thinking for Inquiry
(80 min)

This session is for teachers who have considered adding more inquiry learning to their secondary math courses, but are unsure where and how to begin. We will use design thinking techniques to identify opportunities for increasing inquiry learning in Mathematics at the middle and high school levels, particularly within the IBDP syllabus. Participants will leave the session with concrete ideas to implement in their classes.

Jim Nakamoto – 5B Fri Using the Nspire CX and 84CE in IB Maths (80 min)

Tips will be presented to get the most out of these TI handhelds in the classroom and on the examination papers. Cautions arising from the November 2017 session will also be offered.

◆ Saturday 24 February ◆

Douglas Butler – 1A Sat Exploring explorations with the new Autograph (80 min)

A workshop to take a look at the way Autograph now delivers ‘attributes’ for any objects that have been plotted, and how these attributes can easily and effectively be used in calculations or in other objects – a great new tool for exploring mathematics and for adding meaning to lesson plans. Topics discussed will include inverse functions, introductory calculus and vector geometry in 2D and 3D.

We will also look at the new Argand Diagram page, offering new ways to study the properties of complex numbers as dynamic objects. All delegates will receive a complimentary licence for Autograph 4..

Tim Garry – 1B Sat What I like about the TI-Nspire (80 min)

This session will show a few specific examples highlighting the versatility and benefits of the TI-Nspire that will include some of the following areas:

- calculating tool (equation solver & polynomial root finder)
- learning tool (transformations of graphs / pre-made activities)
- visualization tool (line of best fit / gradient of a curve)
- investigation tool (writing a program)

Mike Wakeford – 2A Sat AUTOGRAPH 4 in Diploma Mathematics (80 min)

This session will focus on how the Autograph 4 environment can be put to work to support conceptual development of topics and themes in the top-end Mathematics curricula.

Ruth Eichholtz– 2B Sat/R Approaches to Teaching Mathematics: Design Thinking for Inquiry
(80 min)

This session is for teachers who have considered adding more inquiry learning to their secondary math courses, but are unsure where and how to begin. We will use design thinking techniques to identify opportunities for increasing inquiry learning in Mathematics at the middle and high school levels, particularly within the IBDP syllabus. Participants will leave the session with concrete ideas to implement in their classes.

Noritzsch/Palovaara – 3A Sat Exploring 3D Geometry (80 min)

Casio's latest IB school calculator fx-CG50 has got a 3D geometry app to help students explore, understand, and solve geometrical problems with lines and planes, for instance. In this workshop a short introduction and many examples of geometrical problems give tools for teaching.

No previous knowledge of Casio products is required. It is recommended to download the fx-CG50 emulator on your PC or Mac via bit.ly/cg50win or bit.ly/cg50mac.

Pieter Schadron – 3B Sat /R Reshaping the way we teach mathematics (80 min)

Pieter Schadron from HP will show you how graphing calculators and software can be used to help students visualize and understand maths in the 21st century. Fully adapted to IB Diploma Programme.

Tim Garry – 4A Sat New IB maths course and Geogebra (80 min)

The new Applications & Interpretation course (starting August 2019) is designed to make “extensive use of technology to allow students to explore and construct mathematical models”, and “to develop mathematical thinking, often in the context of a practical problem and using technology to justify conjectures.” This session will share a few examples of how Geogebra can be a very useful tool to help teachers and students in a maths course with a focus on applications, modelling and problem solving.

Douglas Butler – 4B Sat Maths Tech: where are we and where is it going next? (80 min)

An open discussion session for delegates to share. Douglas will set the scene:

First, a summary of the present-day technology-driven mathematics classroom:

- a. What hardware and software and online resources are available now: are they appropriate and being well used?
- b. Why are so many mathematics teachers choosing not to use digital resources at all?

and looking ahead:

- a. Hopefully what is taught will continue to be adjusted to take account of the changing needs of society, and what technology can teach more effectively
- b. With high-speed connectivity a given, and devices all the more powerful, where do we anticipate software and digital content will take us? Will we need schools as they are now? Learning can happen anywhere.

Wazir/Garry – 5A Sat New IB Route 1: Is it really new? (80 min)

From discussions and published material it appears that very few things have been changed in the IB syllabus for Route 1. A discussion of what is new and how it will effect the way you handle your classes.

Mehdi Ben Shaaban – 5B Sat Inquiry-based learning for HS Math using GeoGebra (80 min)

The closer students get to High School graduation the more direct instruction they seem to be subjected to. The “cover the curriculum” approach is arguably the most time efficient approach to teaching when the goal is to cover the syllabus. But is it the most effective at raising student achievement ? Inquiry-based learning can be done in a structured and intentional way through careful planning and a good use of technology. This session will explore the use of GeoGebra Apps and Materials to create sequences of interactive tasks that allow students to tinker, explore a concept, solve problems and choose from a range of problem-solving strategies all by allowing teachers to monitor their progress.

◆ Sunday 24 February ◆

1A Sun (repeat of a previous session) (80 min)

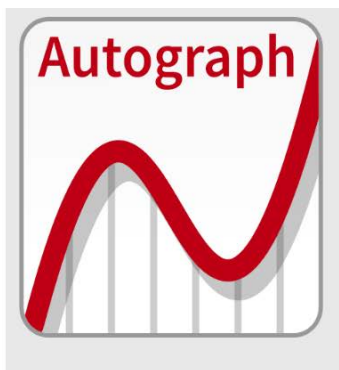
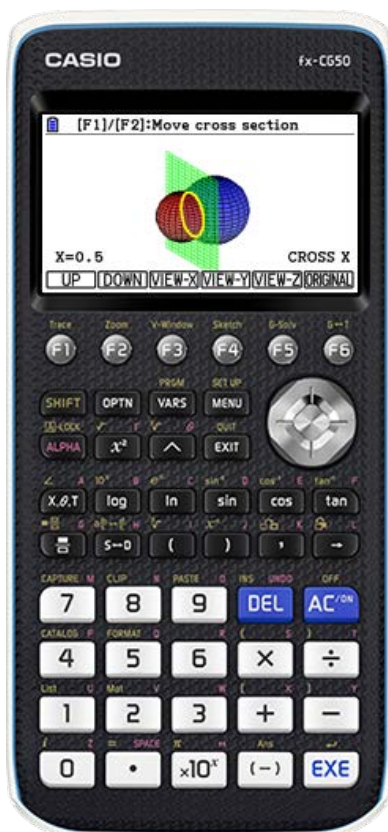
We will decide on repeats as demand for such sessions arises during the previous days.

1B Sun (repeat of a previous session) (75 min)

Panel – 2A Sun (75 min)

Panel discussion about ongoing IB Maths Curriculum Review that will lead to significant changes to the program

conference closing session 11:10 – 11:30



Autograph 4 launched!

Autograph has had a **major make-over**, with a fresh new design. Many **new mathematical objects** have been introduced in both 2D and 3D, and for each object there is an associated list of **'attributes'**. The most dramatic features of the new Autograph 4 involve these attributes, which can selectively be used in the new **"attribute calculator"**, or the new **"XY" attribute point** plot.

There is also a ground-breaking new **"Argand Diagram"** page, enabling complex numbers to be explored through dynamic objects.