2008 MAP Summer School at Trieste-ICTP

Project Presentation

January 2007

1 Introduction.

The MAP Club presents a project for a Summer School in 2008 at Trieste-ICTP.

MAP = Mathematics, Algorithms and Proofs. The members of the MAP Club are mainly interested by the recent evolution of some parts of Mathematics which involve simultaneously standard Mathematics, Logic, theoretical and concrete Computer Science.

The MAP Club has been created in a meeting at Dagstuhl in January 2003. This scientific group regularly organizes scientific meetings around his favourite themes. Usually Tutorial Sessions and Summer Schools are mixed with more common invited talks and communications.

The last MAP meeting took place at Leiden (Netherlands) in January 2007. For 2008, we would like to organize an important Summer School; the Trieste-ICTP has been suggested as an appropriate Research Center to put together major scientists in our various domains and young researchers interested by these subjects.

2 The MAP Club.

The manifesto of the MAP club can be read at[1]:

`http://www.disi.unige.it/map/index.php?q=manifesto`

See also:

`http://www.lc.leidenuniv.nl/lc/web/2007/229/description.php3?wsid=229`

It is there briefly explained how rich and complex are the interconnections between:

1. Practically any field in Mathematics;

[1]The quoted urls can be directly used from the electronic pdf.

2. The various Logics, in particular the so-called Constructive Logic;

3. Theoretical and/or concrete Computer Science.

The items 2 and 3 characterize the scientific style of the MAP members; they are always and firstly *ordinary* mathematicians, but they are also particularly mindful of possible and in fact frequent natural connections with modern Logic and Computer Science. It is striking to observe how in the MAP meetings, colleagues specialized in *different* domains in Mathematics find fruitful the discussions between each other when they are confronted to somewhat similar problems in Logic and/or Computer Science. This experimental fact gives a *multidisciplinary* flavour to our meetings, without any equivalent in traditional mathematical meetings.

A list of the current MAP participants is at:

`http://www.disi.unige.it/map/index.php?q=accueil`

To quickly have a rough idea of our common activities, the site about our last Summer-School (Genova, August-September 2007) is:

`http://map.disi.unige.it/summer_school/index.php?page=2`

and the site about our last Meeting (Leiden, January 2007):

`http://www.lc.leidenuniv.nl/lc/web/2007/229/extra.php3?wsid=229`

3 The planned Summer School.

A three-week Summer School is planned. In principle we thought firstly to devote the two first weeks to the Summer School itself, the third week being rather a standard meeting with other invited talks and communications by young researchers. But we have been a little surprised by the high acceptation rate of the contacted possible lecturers; if no later resignation, it certainly would be better to devote the whole three weeks to the Summer-School, with maybe only two or three extra invited talks.

We propose three possible dates for this three weeks 2008 Summer School (preference order):

1. August 18 – September 8.
2. August 4 – August 25.
3. June 23 – July 14.

Scientific Committee[2]:

- Thierry Coquand (Chalmers University).
- Alicia Dickenstein (University of Buenos Aires).
- Tornike Kadeishvili (University of Tbilisi).
- Marie-Françoise Roy (University of Rennes).

Lecture program:

- A = B (Peter Paule, Linz).
- Algorithms and Algebraic Geometry (Gert-Martin Greuel, Kaiserslautern).
- Computational Algebra (Teo Mora, Genova).
- Constructive Algebra (Ihsen Yengui, Sfax).
- Constructive Analysis (Douglas Bridges, Canterbury).
- Constructive Logic (Thierry Coquand, Chalmers).
- Effective Arithmetic and Motives (Alexei Pantchichkine, Grenoble).
- Groebner Basis (Jean-Charles Faugère, INRIA).
- Homotopy Lambda-Calculus (Vladimir Voevodsky, Princeton-IAS).
- Introduction to Combinatorial Homotopy (Francis Sergeraert, Grenoble).
- Introduction to Type Systems (Thierry Coquand, Chalmers).
- Operadic Algebraic Topology (Tornike Kadeishvili, Tbilisi).
- Point Free Topology (Erik Palmgren, Uppsala).

All the lecturers have explicitly given agreement. The only reservation is in the case of Vladimir Voevodsky: he gave agreement but he is not yet absolutely confident about the value of his revolutionary point of view in type theory and he will confirm his participation according to later appreciations. Both courses "Introduction to..." are intended to prepare the audience to Voevodsky's lectures.

The Organizing Committee is the Board of the MAP Club:

- Thierry Coquand (Chalmers University).
- Henri Lombardi (University of Besançon).
- Giuseppe Rosolini (University of Genova).
- Marie-Françoise Roy (University of Rennes, current SMF President).
- Helmut Schwichtenberg (University of München).
- Peter Schuster (University of München).
- Francis Sergeraert (Fourier Institute, Grenoble).

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[2]CVs (or equivalent home page for Alicia) are attached to the same mail.