

12 - 24 November 2007

Bibliotheca Alexandrina, Alexandria, Egypt

The Abdus Salam International Centre for Theoretical Physics (ICTP), the Bibliotheca Alexandrina and the International Centre for Pure and Applied Mathematics (CIMPA) are organizing a School on "Algebraic Approach to Differential Equations" from 12 to 24 November 2007. The activity will be directed by Mohamed Darwish (Alexandria University, Egypt), Mohamed Fahmy (Al-Azhar University, Egypt), Lê Dũng Tráng (ICTP, Italy), Mohamed Yousif (The American University in Cairo, Ohio State University at Lima).

An interesting trend of mathematics has developed a strong interaction between methods of Algebra, Homological Algebra, Algebraic and Analytic Geometry and Differential Equations. This interaction can be already found in the work of B. Riemann which related period integrals of elliptic curves and the hypergeometric equation. A better understanding of this interaction in dimensions > 1 lead to generalisations of the hypergeometric equation and to methods to calculate asymptotic developments of singular integrals. The aim of the School is to gather the mathematical material needed to understand these generalisations and introduce young scientists to these important methods. It is also an opportunity to promote between the communities of algebraists and analysts a dialogue which is often insufficient, especially in developing countries.

The School will be organized in several mini-courses, including:

The ring of differential operators (F. Castro, University of Seville, Spain)
The sheaf D of differential operators and D-modules (L. Narvaez, University of Seville, Spain)
The theory in dimension 1 (L. Narvaez, University of Seville, Spain)
Bernstein Equation and functional equations (M. Granger, University of Angers, France)
Singular integrals and the stationary Phase methods (E. Delabaere, University of Angers, France)
Differentiable systems over the p-adic numbers (Z. Mebkhout, CNRS, Paris)
Gauss-Manin connection and the hypergeometric equation (Lê D.T., ICTP)
Hyperplane arrangements and generalisation of the hypergeometric equation (L. Paris, University of Dijon, France)

DIRECTORS

MOHAMED DARWISH (Egypt) MOHAMED FAHMY (Egypt) LE DUNG TRANG (Italy) MOHAMED YOUSIF (Egypt)

A small Conference will be held at the end of the School and will gather F. Castro (University of Seville, Spain), E. Delabaere (University of Angers, France), M. Granger (University of Angers, France), Lê D.T. (ICTP), B. Malgrange (Academy of Sciences, France), Z. Mebkhout (CNRS, Paris), L. Narvaez (University of Seville, Spain), L. Paris (University of Dijon, France), B. Teissier (CNRS, Paris)

Mathematicians from all countries that are members of the UN, UNESCO or IAEA in the area of the Middle East may attend the School. The main purpose of the ICTP is to help researchers from developing countries through a programme of training activities within the framework of international cooperation. However, students and post-doctoral scientists from developed countries are also welcome to attend. As the School will be conducted in English, participants should have an adequate working knowledge of that language.

Limited funds are available for some research workers who are nationals of, and working in, a developing country in the Middle East area. As scarcity of funds allows travel to be granted only in a few exceptional cases, every effort should be made by candidates to secure support for their fares (or at least half fare) from their home country. Such support is available only for those who attend the entire activity. There is no registration fee to attend the School.

The closing date for the receipt of requests for participation is 30 May 2007 The Request for Participation Form is obtainable from the ICTP WWW Server: http://agenda.ictp.it/smr.php?1873 The completed Request Form should be signed and sent to:

the Abdus Salam International Centre for Theoretical Physics "School on Algebraic Approach to Differential Equations" (SMR 1873, c/o Ms. K. Mabilo)

Strada Costiera 11 I-34014 Trieste, Italy

Telephone: +39-040-2240-455 Telefax: +39-040-2240-490 E-mail: <u>smr1873@ictp.it</u> (please save and send file attachments in PDF) ICTP Home Page: <u>http://www.ictp.it/</u>

Trieste, May 2007

LECTURERS will include:

F. Castro (Spain)

E. Delabaere (France)

M. Granger (France)

Lê D.T. (Italy)

Z. Mebkhout (France)

L. Narvaez (Spain)

L. Paris (France)

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