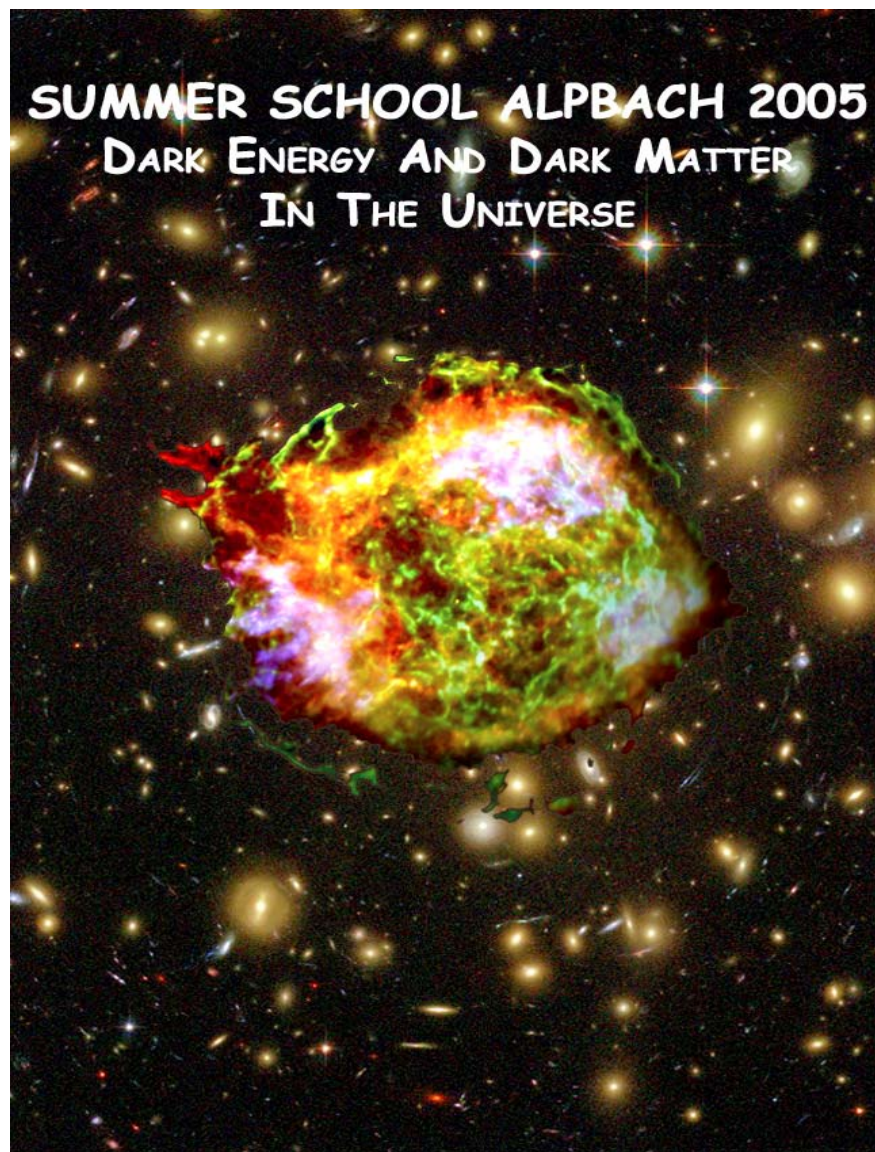


**FFG**

ÖSTERREICHISCHE  
FORSCHUNGSFÖRDERUNGSGESELLSCHAFT  
AUSTRIAN RESEARCH PROMOTION AGENCY  
AERONAUTICS AND SPACE



## SUMMER SCHOOL ALPBACH ANNOUNCEMENT 2005



July 19 –28, 2005, Alpbach/Tyrol – Austria  
available on <http://www.asaspace.at>

## **THE SUMMER SCHOOL ALPBACH**

Held annually since 1975, the Alpbach Summer School enjoys a long tradition in providing in-depth teaching on aspects of space science and space technology with the aim of advancing the training and working experience of European graduates, post-graduate students, young scientists and engineers.



Participants are given the opportunity to expand and strengthen their knowledge of selected space issues in workshops which are part of the Summer School programme. 2005 will be the 29th Alpbach Summer School in this long-running series and will focus on the theme

### **“Dark Energy and Dark Matter in the Universe”.**

The purpose of the Summer School is to foster the practical application of knowledge derived from lectures, to develop organisational and team-work skills and to encourage creativity. Teams will compete to execute the best project, judged by an independent jury. The teams themselves are responsible for the selection of the subject of the project and for the team structure and working methods.

## **ORGANISERS AND CO-SPONSORS**

The Summer School is organised by the Austrian Research Promotion Agency (FFG/Aeronautics and Space) and co-sponsored by the European Space Agency (ESA) and the national space authorities of its member states.

## **PROGRAMME COMMITTEE**

### **Chairman:**

Harald Posch, Austrian Research Promotion Agency/Aeronautics and Space (FFG), Vienna

**Director of the Summer School:** Johannes Ortner, Austria

### **Summer School Administration:**

Michaela Gitsch, Austrian Research Promotion Agency/Aeronautics and Space (FFG), Vienna

Bo Andersen, Norwegian Space Centre, Oslo

Wolfgang Baumjohann, Space Research Institute of the Austrian Academy of Sciences, Graz

Roger Bonnet, ISSI, Berne

Thierry Courvoisier, Swiss Academy of Natural Sciences, Versoix

Roger Elaerts, ESA

Kari Enqvist, University of Helsinki

Johannes Geiss, Switzerland

Alvaro Gimenez, ESA/ESTEC

Henrik Grage, Ministry of Science, Technology and Innovation, Copenhagen

Günther Hasinger, Max Planck Institute for extraterrestrial Physics, Garching

Josef Hoell, DLR, Bonn

Martine Joubert, CNES, Toulouse

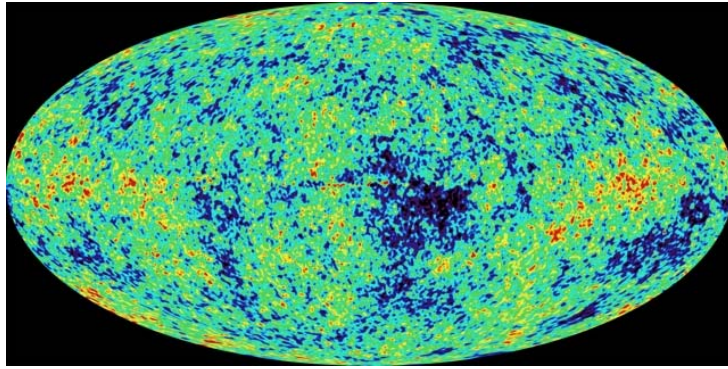
David Parker, BNSC, London

Rafael Rebolo, Spain

Sabine Schindler, Institute of Astronomy of the University of Innsbruck

Martin Turner, University of Leicester

Martin Ward, University of Durham



## **PROGRAMME**

Lectures will deal with the issues specific to

- Introduction to Cosmology
- Overview of Dark Energy and Dark Matter in the Universe
- Physical Nature of Dark Energy
- Dark Matter - Particle Physics beyond the Standard Model
- Early Universe from the Cosmic Microwave Background
- Geometry of the Universe measured with Supernovae
- Large Scale Structure and Gravitational Lensing
- Clusters of Galaxies as Probes of Dark Matter and Dark Energy
- Detection of Dark Matter Decay
- Cosmic Vision - Overview of ESA Missions
- Dark Universe Missions in Global Planning
- Cosmic Microwave Surveys
- Supernova and Lensing Surveys
- X-ray Surveys of Clusters of Galaxies
- Mission Phases, Mission System Engineering, Spacecraft Design
- Launchers and Satellite Orbits
- Optics and Telescopes
- Sensors and Instruments
- Scientific Methods to Derive Cosmological Constraints



The lectures will be given by renowned experts in the above fields.

A key element of the summer school is the workshop, to which more than 50% of the time spent in Alpbach will be given. Students will be formed into four teams, each of which will study a different scientific space mission, designed to answer some of the key questions relating to the Summer School topic—Dark Matter and Dark energy in the Universe. The teams will be supported by tutors who are experts in space mission design, and by the lecturers. Many of the lecturers will



be present throughout the duration of the Summer School and will assist the teams with the definition of the missions. The purpose of the workshop will be to develop four mission concepts—one by each team, to the point where a space agency could, in principle, take it over and begin the first stage of mission preparation. By the end of the workshop, the teams will have considered not only the instrumentation—having shown that it can meet the scientific requirements, but also the spacecraft orbit, its construction, its sub systems, and its launch, together with a cost estimate. The results of the projects will be delivered as short “mission studies” to be presented by each team, during the final workshop day, to an expert review panel. Lectures will be provided on space mission design and other technical topics relevant to the workshops.



Joint evening dinners (sometimes with after dinner speeches on subjects of general scientific interest) will be organised at the Fichtensaal of the Hotel Böglerhof for lecturers, tutors, students and accompanying persons to provide a convivial atmosphere for informal discussions.

## ***PARTICIPATION***

The Summer School is open to graduates as well as post-graduate students and young scientists and engineers from among the member states of the European Space Agency. The working language of the Summer School will be English.

The attached application form, duly endorsed by a university professor, head of department or equivalent, should be submitted to the Austrian Research Promotion Agency (Aeronautics and Space) before **March 31, 2005**. The number of participants will be limited to 60 and confirmation of acceptance will be given by the end of **April 2005**.

**A registration fee of € 300,-** will be charged. This fee covers working material, copying and computer facilities, coffee breaks and dinners.

## ***FINANCIAL SUPPORT***

Participants from Austria, Belgium, Denmark, Finland, France, Germany, Greece (tbc), Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Switzerland, Sweden and the UK may be eligible for financial support by the relevant national sponsoring agencies or universities. For support of participation, travel and subsistence costs, Belgian and Italian students will be informed by the national point of contact to apply to their universities. The application form should indicate the status of application for support.

For additional information on the Summer School and on financial support for participation, please contact your national representative, i.e.:



Austrian Research Promotion Agency (FFG), Aeronautics and Space, Canovagasse 7, A-1010 Vienna, Attn: Michaela Gitsch, tel: +43-(0)5-7755 3302, fax: + 43-(0)5-7755 93302, e-mail: michaela.gitsch@ffg.at



Belgian Science Policy Office (BELSPO), Section Space Research and Applications, Wetenschapsstraat 8, Rue de la Science, B-1000 Brussels, Attn: Mr. Werner Verschueren, tel :+ 32-2-238 3589 fax: +32-2-2305912, e-mail: verw@belspo.be \*)



Ministry of Science, Technology and Innovation, Bredgade 43, DK-1260 Copenhagen K., Attn: Edel Bregnbæk, tel: +45-33-929082, fax: +45-33-92150205, e-mail: ebr@fsk.dk



Academy of Finland, Research Council for Natural Sciences and Engineering, P.O. Box 99, FIN-00501 Helsinki, Attn: Mr. Pentti Pulkkinen, tel: +358-9-7748 8342, fax: +358-9-7748 8393, e-mail: pentti.pulkkinen@aka.fi



Centre National d'Etudes Spatiales (CNES), DSP/EU, 18, Av. Edouard Bélin, F-31404 Toulouse, Cedex 4 , Attn: Mrs. Martine Joubert, tel. +33-5-61 27 39 12, fax : +33-5-61 27 30 91, e-mail : martine.joubert@cnes.



Deutsches Zentrum für Luft- und Raumfahrt (DLR), Raumfahrtmanagement Extraterrestrik, Königswinterer Straße 522-524, D-53227 Bonn-Oberkassel, Attn: Mr. Josef Hoell, tel: +49-228-447 381, fax: +49-228-447 745 , e-mail: [josef.hoell@dlr.de](mailto:josef.hoell@dlr.de)



Hungarian Space Office, Dob u. 75-81, H-1077 Budapest, Attn: Dr. Előd Both, Director, tel: +36-1-461-3639, fax: +36-1-351-0353, e-mail: both@hso.hu



Enterprise Ireland, International Programmes, Glasnevin, IR-Dublin 9, Attn: Dr. Ronan Breslin, tel: +353-1-808 2707, fax: +353-1-837 0178, e-mail: ronan.breslin@enterprise-ireland.com



Italian Space Agency (ASI), Viale Liegi 26, I-00198 Roma, Attn: Mr. Francesco Rea, tel: +39-06-8567 235, fax: +39-06-8416265, e-mail: francesco.rea@asi.it\*)



Norwegian Space Centre (NSC), Drammensveien 165, P.O. Box 113 Skoyen, N-0212 Oslo, Attn: Dr. Bo Andersen, tel:+ 47-22-511830, fax: +47-22-511801, e-mail: bo@spacecentre.no



Space Research Organisation of the Netherlands (SRON), Sorbonnelaan 2, NL-3584 CA Utrecht, Attn: Dr. Gerard Cornet, tel: +31-30-2535702, fax: +31-30-2540860, e-mail: G.Cornet@sron.nl



GRICES-Office for International Relations in Science and Higher Education, Av. 5 de Outubro, 85, 5º, 1050-050 Lisboa, Portugal, Attn: Mrs. Sofia Seabra, tel. +351-21-782 83 52, fax. +351-21-797 16 87, e-mail: sofia.seabra@grices.mces.pt



Centro para el Desarrollo Tecnológico Industrial (CDTI), C/Cid. 4, E-28001 Madrid, Attn: Mr. Manuel Serrano Ariza, tel: +34-91-581 55 00, fax: +34-91-581 55 84, e-mail: msa@cdti.es\*\*)



Swedish National Space Board (SNSB), Solna strandväg 86, Box 4006, S-17104 Solna, Attn: Mr. Per Magnusson, tel: +46-8-6276492, fax: +468-6275014, e-mail: per.magnusson@snsb.se



Schweizerische Akademie für Naturwissenschaften (SANW), Integral Science Data Centre, Chemin d'Ecogia 16, CH-1290 Versoix, Attn: Prof. Thierry Courvoisier, tel:+ 41-22-950 91 01, fax: +41-22-950 91 33, e-mail: Thierry.Courvoisier@obs.unige.ch



Particle Physics and Astronomy Research Council (PPARC), Attn: Mr. Steve Cann, Head of Education, Training and Careers Section, Polaris House, North Star Avenue, Swindon, SN2 1SZ, tel: +44-01-793 442026, fax:+44-01-793 442036, e-mail: steve.cann@pparc.ac.uk

\*) for support of participation, travel and subsistence costs, Belgian and Italian students will be informed by the national point of contact to apply to their universities

\*\*\*) Spanish applicants can seek funding through Dr. Miguel Mas-Hesse, LAEFF, Apartado 50727, 28080 Madrid, tel: +34-91-8131196, fax: +34-91-8131160, e-mail: mm@laeff.esa.es



### LOCAL ARRANGEMENTS

The beautiful village of Alpbach with its 2.300 inhabitants is situated in a small mountain valley, 1000 m above sea level. You can reach Alpbach by car on the Inntal motorway, exit Kramsach. From there it is only 10 km to Alpbach. The nearest railway stations are situated at Wörgl (25 km), Jenbach (20 km) and Brixlegg (10 km). If you choose to come by air, you can fly into Innsbruck (60 km), Salzburg (150 km) or Munich (160 km).

The Summer School will be held in the School House of Alpbach.



All participants (students, tutors, lecturers and accompanying persons) will have joint dinners throughout the period of the Summer School at the Hotel Böglerhof (10-15 minutes walking distance from the School).

Bed & breakfast accommodation in Alpbach will be organised by the Austrian Space Agency for all participants. Relevant information will be forwarded to the participants in early May 2005. Costs for bed & breakfast accommodation amount to about € 30,- per night, a stay of 11 nights is essential.



Students will be requested to arrive in Alpbach on Monday, July 18, and depart on Friday, July 29, 2005.

# Application Form

(to be returned *before March 31, 2005*)

Michaela Gitsch  
Austrian Research Promotion Agency (FFG)  
Aeronautics and Space  
Canovagasse 7, A-1010 Vienna

michaela.gitsch@ffg.at  
tel. +43(0)5-7755 3302  
fax. +43(0)5-7755 93302

**Name:** .....

**University/Organisation (full mailing address):**

.....  
.....  
.....

Tel..... Fax: .....

e-mail: .....

**Private address:**

.....  
.....  
.....  
.....

Tel: ..... Fax:.....

e-mail:.....

**Scientific background:**

.....  
.....  
.....

**Special field of interest:**

.....  
.....  
.....

Age: .....

I wish to attend the Summer School Alpbach 2005 and apply for financial support to

- Academy of Finland     CNES     DLR     Danish Ministry  
 Enterprise Ireland     FFG/Aeronautics and Space     Hungarian Space Office  
 GRICES     LAEFF     NSC     PPARC     SANW  
 SNSB     SRON     my university

**Application endorsed by:**

Name .....

Institute .....

Signature of endorser

.....