



SUMMER SCHOOL ALPBACH 2009

“Exoplanets: Discovering and characterizing Earth type planets”



ANNOUNCEMENT

July 21 –30, 2009, Alpbach/Tyrol – Austria
available on <http://www.summerschoolalpbach.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. Student teams will develop space mission concepts based on the theme of the Summer School. The 2009 Summer School Alpbach will focus on the theme

“Exoplanets: Discovering and Characterizing Earth Type Planets”

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 design 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 Aeronautics and Space Agency of FFG and co-sponsored by the European Space Agency (ESA) and the national space authorities of its member and cooperating states. A traditional partner is the International Space Science Institute (ISSI). It is also supported by Austrospace, the association of Austrian space industries and research institutions.

THE PROGRAMME COMMITTEE

Chairman:

Harald Posch, FFG/Aeronautics and Space Agency, Vienna

Summer School Director: Johannes Ortner, Vienna

Summer School Administrator: Michaela Gitsch, FFG/Aeronautics and Space Agency, Vienna

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Harry Varvoglis, University of Thessaloniki

Sven Wedemeyer-Böhm, University of Oslo

THE SUMMER SCHOOL PROGRAMME

The Summer School Alpbach 2009 will address innovative mission concepts aiming to increase our knowledge of extrasolar planets. The missions will aim at discovering more planets and different types of planets around other stars, with an emphasis on Earth-like planets. The objectives include not just the discovery, but also the characterisation of extrasolar planets. The missions will thus aim to search specifically for Earth-like planets in solar systems like ours and surveys of the habitable zones around stars.

The goals of research into extrasolar planets are

- to understand the formation of other planetary systems and their characterisation;
- the search for planets with a potential for sustaining life;
- to search for biomarkers to detect the existence of life outside our solar system.

The first planets around stars other than our Sun were detected in the 1990s from the ground. Since then, the number of known extrasolar planets has been increasing rapidly, mainly through intensive search by ground-based astronomical observatories. There are today in excess of 300 known exoplanets, in more than 250 planetary systems, and the search for them continues. However, space-based observations are already beginning to make a difference in our detection capabilities, as shown by the recent first visible-light observation of a planet orbiting the star *Formalhaut* at 25 light years away. More dedicated missions, such as the small Canadian MOST (Microvariability and Oscillations of STars) and the French CoRoT (CONvection, ROTation & planetary Transits) have initiated modest, but significant searches. More ambitious missions, such as ESA's Darwin and NASA's Terrestrial Planet Finder are being studied for implementation in the next decade or so.

Due to the limitations of current observing capabilities, most of the exoplanets so far discovered are of the "hot Jupiter type", large, massive planets orbiting very close to their central star. However, increased capabilities have already found some almost Earth-size planets, and finding more such interesting objects is clearly a question of technological and observational resources. The aim of the Alpbach 2009 Summer School is to look far, for such objects, and to assess mission concepts that would be able to discover and characterise these Earth-like exoplanets.

The Summer School Alpbach objectives

- motivating participants to seeing space as an exciting and challenging endeavour
- working in international, multi-disciplinary teams by posing challenging topics for designing space missions
- teach a range of scientific topics relevant to the range of possible science missions to design, and to teach about the different aspects of the complex interplay between scientific objectives and requirements on the one hand, mission- and spacecraft design as well as mission costing on the other hand
- to develop the ability to work in teams for a common end, to prepare presentations and reports under serious time constraints
- to enjoy the "Alpbach experience" that is quite unique

THE WORKSHOPS

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 and design a different scientific space mission intended to answer some of the key questions relating to the Summer School topic. 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 60 selected young science and/or engineering students and graduates from among the member and cooperating states of the European Space Agency (ESA)^{*)}. 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 Aeronautics and Space Agency of FFG before **March 31, 2009**. The number of participants will be limited to 60 and confirmation of acceptance will be given by the end of **April 2009**.

A registration fee of € 370,- will be charged. This fee covers working material, free access to copying and computer, e-mail and internet facilities at the School House, coffee breaks and dinner vouchers (including one free drink per evening) throughout the period of the Summer School including the weekend.

^{*)} **ESA Member States:** Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom

Associate member: Canada

Cooperating States: Hungary, Romania, Poland

FINANCIAL SUPPORT

Participants from Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Switzerland, Sweden and the UK as well as Hungary and Romania and the European Southern Observatory (ESO) may be eligible for financial support by the relevant national sponsoring agencies or universities. Students might be informed by the national point of contact to apply to their universities for support of participation, travel and subsistence costs. 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.:

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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 Böglhof (10-15 minutes walking distance from the School). Vouchers for the dinners including one free drink per evening will be distributed to all selected participants upon registration.

Bed & breakfast accommodation in Alpbach will be organised by the Aeronautics and Space Agency of FFG for all participants. Relevant information will be forwarded to the participants in early May 2009. Costs for bed & breakfast accommodation amount to about € 40,- per night, a stay of 11 nights is essential.



Students will be requested to arrive in Alpbach on Monday, July 20, and depart on Friday, July 31, 2009.

**Online Application before March 31, 2009 via
<http://www.summerschoolalpbach.at>**