



first circular for the International Workshop on

Positrons in Astrophysics

20-23 March 2012, Mürren, Bernese Oberland, Switzerland

Positrons are the most common and easily produced form of antimatter, both in the laboratory and in astrophysical scenarios. In the eighty years since their prediction and their experimental discovery they have become a major player in physics and astrophysics, spanning very disparate fields from galactic astrophysics to semi-conductor and surface physics, not to mention medical and industrial applications. In each of these wide domains huge progress has been made in theory, experimental methods, and modeling. Yet major questions and puzzles remain. The breadth and diversity of the fields involved have tended to limit the extent to which the various “positron communities” interact and learn from each other. A key aim of this meeting is to bring scientists working in the disciplines of atomic, molecular, surface and materials physics together with colleagues whose interests lie in various astrophysical fields.

While the emphasis will be on topics directly related to positrons in physics and in astronomy, the scope of the workshop will also include other forms of antimatter both in the laboratory and in space. Review talks on a variety of antimatter topics will set the context and summarize the current state of the art in the different fields, while more specialized presentations will report on the latest developments. The objectives of the workshop are to identify the specific issues to be tackled next in each domain and to encourage future progress through interactions between the different research areas within and beyond positron science.

Context setting summary talks

- Baryon asymmetry and CPT violation
- Nuclear antimatter in astrophysics
- Antimatter atoms (cold antihydrogen, antimatter spectroscopy, antimatter gravity)
- Direct detection of Cosmic Positrons
- Astrophysics through e-e⁺ Annihilation Radiation
- Positrons and antiprotons from dark matter
- Positron scattering and annihilation in atomic, molecular and condensed matter systems
- Positronium formation and interactions with matter
- Theory of low-energy positron matter interactions

Topics in positron physics and astrophysics

- In situ measurements of cosmic ray positrons (Pamela, AMS, HEAT ...)
- Observation of Galactic annihilation radiation (gamma, positronium recombination lines)
- Positrons from particle interactions (accelerators / relativistic outflows in astrophysics)
- Positrons from radioactivity
- Electron-Positron plasmas
- Slowing and thermalisation of positrons, in interstellar space and in denser environments
- Positronium and its recombination signatures
- The annihilation process and what we can learn from it
- Positron and positronium interactions with matter

- Antihydrogen: formation, trapping and study
- Laboratory modeling of astrophysical processes
- Future instrumentation

Venue

The workshop takes place at the Hotel Alpin Palace in Mürren, Switzerland. At an elevation of 1650 m, perched on a high, sunny terrace facing the famous Eiger, Mönch and Jungfrau, Mürren is located amidst some of the world's most spectacular scenery. Coming from Bern via Interlaken, Mürren is reached by a mountain railway or by aerial cableways running from the Lauterbrunnen valley into the centre of the car-free village. Mürren has remained a charming little village rich of traditions; it has managed to escape over-development despite being famous in the history of winter sports and through movies (eg. 007). As the highest altitude ski resort in the Bernese Oberland, the winter sports region of Mürren-Schilthorn (2970 m) offers very good snow conditions into April ...

Scientific Organization Committee

Felix Aharonian (DIAS Dublin)
 Roberto Battiston (INFN Perugia)
 Céline Boehm (IPPP Durham / LAPTH Annecy)
 Igor Bray (Curtin University, Perth)
 Michael Charlton (Swansea University)
 Eugene Churazov (MPI Astrophysik Garching)
 Paul Coleman (University of Bath)
 Gleb Gribakin (Queen's University Belfast)
 Nidhal Guessoum (American University of Sharjah)
 Toshio Hyodo (KEK Tsukuba)
 Pierre Jean (IRAP Toulouse)
 Mark Leising (Clemson University)
 Pierrick Martin (IPAG Grenoble)
 Piergiorgio Picozza (INFN Rome)
 Nikos Prantzos (IAP Paris)
 Gerry Skinner (GSFC Greenbelt)
 Clifford Surko (UCSD San Diego)
 Pietro Ubertini (IASF Rome)
 Tadayuki Takahashi (ISAS Tokyo)
 Peter von Ballmoos (IRAP Toulouse)

Further information at www.astropositron.org

Expression of interest

Please complete the Expression of Interest form on the site below to ensure that you receive more information on the "International Workshop on Positrons in Astrophysics " and to indicate the likelihood of attending and presenting a contributed talk or a poster.

http://www.astropositron.org/expression_of_interest.html