



## URSI-FRANCE SCIENTIFIC WORKSHOP

# THE NEXT GENERATION RADIOTELESCOPES: HIGH-TECH AND SCIENTIFIC PROGRESSES

**29 - 30 MARCH 2011**

**CNAM, 292 RUE SAINT-MARTIN, PARIS 3<sup>ÈME</sup>**

### SCIENTIFIC WORKSHOP

The URSI-France 2011 Scientific Workshop «**The Next Generation Radiotelescopes**», organized under the auspices of the French Academy of Science, will take place at the Conservatoire National des Arts et Métiers (CNAM) in Paris.

Radioastronomy is entering a new and promising era with exceptional discoveries. They benefit from the worldwide development of projects and from the application of the most advanced technologies that are shared with all radiosciences. Noteworthy, the recent missions of the European Space Agency (Rosetta, Herschel, and Planck) constitute remarkable successes. They bring a wealth of new results in all fields of astrophysics, from planetary sciences to cosmology. The next generation radiotelescopes will need high sensitivity receivers, phased arrays, high capacity data links, unprecedented computing capacities, etc. that are presently under development. Ground-based facilities in advanced stages of construction, such as LOFAR, MeerKAT, ASKAP, ALMA, etc., will allow us to demonstrate their feasibility. These developments, also of importance to geosciences, will be discussed in an international context. The JS'11 workshop will offer the opportunity to approach these matters in the pluridisciplinary environment of URSI-France.

Among different topics, we will address:

- **The exceptional results achieved by space missions, such as Herschel;**
- **The new technologies of detection and signal processing;**
- **The construction of powerful instruments exploiting these new technologies (NOEMA, EVN);**
- **The progresses in beam forming;**
- **The development of the next generation radiotelescopes (LOFAR, ALMA, SKA);**
- **The optical links allowing us to synchronize distant antennas;**
- **The new strategies to mitigate the crowding of the spectrum and to fully benefit from the high sensitivity of modern receivers;**
- **The effects of the Earth atmosphere and ionosphere on radioelectric propagation.**



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## PROGRAMME

**Tuesday, March 29 2011**

|                                 |   |
|---------------------------------|---|
| 8h – 9h                         | <b>Welcome and registration of participants:</b> Amphi Abbé Grégoire  |
| 9h – 10h10                      | <b>Opening Session.</b><br>Chair: <b>Thibaut Le Bertre</b>  |
| Opening Conf.<br>Communication  | <ul style="list-style-type: none"><li>- <b>Exploring the submillimeter and infrared spectrum with the Herschel Space Observatory:</b> Pierre Encrenaz and Maryvonne Gerin</li><li>- Water in massive star-forming regions with the Herschel Space Observatory, F. Herpin et al.</li></ul>   |
| Coffee break                    |   |
| 10h30 – 12h30                   | <b>Session: "Sensors and antenna arrays".</b><br>Chair: <b>Rodolphe Weber</b>   |
| Invited Conf.<br>Communications | <ul style="list-style-type: none"><li>- <b>Antenna arrays : towards the new wide-field radiotelescopes ,</b> Philippe Picard</li><li>- Synthesis of 327 MHz interferometric images with high dynamic range, J. Uson and W. Cotton</li><li>- Wide-field imagery and calibration with LOFAR, C. Tasse</li><li>- Antenna design and distribution for a LOFAR Super Station in Nançay, G. Girard et al.</li><li>- Study of Array Architectures for ESA's Future Deep Space Ground Station Antennas, S. Marti et al.</li><li>- FAN: a focal plane array study for the Nançay radiotelescope, J.-M. Martin et al.</li></ul> |
| Lunch                           |   |
| 14h00-16h00                     | <b>Session: "Next generation millimeter and submillimeter radiotelescopes",</b><br>Chair: <b>Gérard Beaudin</b>   |
| Invited Conf.<br>Communications | <ul style="list-style-type: none"><li>- <b>Road map for (sub) millimeter astronomy and IRAM's projects,</b> Karl-Friedrich Schuster</li><li>- Development of super-conductor HEB mixers for radioastronomy at THz frequencies, Y. Delorme et al.</li><li>- Upgrade of EMIR's band 3 and band 4 mixers, D. Maier et al.</li><li>- Status of ALMA Band 7 Cartridge Production, S. Mahieu et al.</li><li>- Next Generation Correlators, B. Quertier et al.</li><li>- A data model for next generation radiotelescopes, F. Viallefond</li></ul>   |
| Coffee break                    |   |
| 16h20-18h                       | <b>Session: "Next generation long wavelength radiotelescopes".</b><br>Chair: <b>Stephen Torchinsky</b>  |
| Invited Conf.<br>Communications | <ul style="list-style-type: none"><li>- <b>Next generation long wavelength radiotelescopes,</b> Françoise Combes</li><li>- Next generation VLBI Networks, P. Charlot</li><li>- Radioastronomy with LOFAR, J.-M. Grießmeier et al.</li><li>- Analysis of the RATAN600 radiotelescope antenna with a multilevel Physical Optics algorithm, C. Letrou et al.</li><li>- BAORadio: 3D mapping of the HI distribution in the universe, R. Ansari et al.</li></ul>   |
| 18h00-20h00                     | <b>CNFRS Medal</b><br><b>URSI Student Prize</b><br><b>Cocktail</b>  |

## Wednesday, March 30 2011

|                                 |  |
|---------------------------------|--|
| 8h30-09h40                      | <b>Session: "Space Missions"</b><br>Chair: <b>Monique Dechambre</b>  |
| Invited Conf.<br>Communications | <ul style="list-style-type: none"> <li>- <b>SMOS, a radio interferometric space mission</b>, Philippe Waldteufel, Yann Kerr and Jacqueline Boutin.</li> <li>- Compact Radiometer Development for Multi-Channel Submillimeter Wavelength Atmospheric Studies, J. Treuttel et al.</li> <li>- Submillimeter radiometry for cloud and rain characterization : from simulation to concepts of Earth observing missions, E. Defer et al.</li> </ul>  |
| Coffee break                    |  |
| 10h00-12h30                     | <b>Session: "High sensitivity receivers and interferences".</b><br>Chair: <b>André Deschamps</b>   |
| Invited Conf.<br>Communications | <ul style="list-style-type: none"> <li>- <b>Frequency Protection for Space Science Missions</b>, Jean Pla</li> <li>- Kinetic inductance detectors for radio astronomy, A. Monfardini et al.</li> <li>- Study of a dual polarization SIS heterodyne receiver array for the 3mm band of the Pico Veleta telescope, A.-L. Fontana et al.</li> <li>- New Generation of 15K X Band Cryogenic Low Noise Amplifier for DSA Network, S. Halté et al.</li> <li>- Cyclostationary approaches for spatial RFI mitigation in radioastronomy, G. Hellbourg et al.</li> <li>- Real-time RFI mitigation on a new generation digital board: UNIBOARD, S. Changuel et al.</li> <li>- Blind Detection of Giant pulses: GPU implementation, D. Ait-Allal et al.</li> <li>- Development of a broadband receiver at the Nançay radiotelescope, P. Colom et al.</li> </ul> |
| Lunch                           |  |
| 14h10-16h00                     | <b>Session: "Reference Time" and "Outreach."</b><br>Chair: <b>Ouali Acef</b>   |
| Invited Conf.<br>Communications | <ul style="list-style-type: none"> <li>- <b>Time and Frequency Standards - State of the art</b>, Noël Dimarcq</li> <li>- Optical Link for Ultra-Stable Frequency transport using the Public Telecommunication Network, A. Amy-Klein et al.</li> <li>- LASIC Project: Molecular Iodine Frequency stabilized laser for space application, C. Zumsteg et al.</li> <li>- Connecting the Classrooms to the Milky Way, P. Salomé</li> <li>- A new approach using waves to teach Physics, P. Fuerxer</li> </ul>   |
| Coffee break                    |  |
| 16h20-18h                       | <b>URSI-France General Assembly</b>  |
|                                 |  |

## ORGANISATION

The Scientific Workshop will be held at **CNAM, 292 rue Saint-Martin, Paris 3<sup>rd</sup>**. It will start on Tuesday, March 29 at 9:00 a.m., and end with the General Assembly of URSI-France on Wednesday, March 30, due at 4 p.m.

The workshop is organized around **oral sessions**. These sessions will be introduced by **invited lecturers** presenting the state of the art and/or recent developments.

The working language will be preferably French, papers and slides can be in English.

| SCIENTIFIC COMMITTEE  | ORGANIZING COMMITTEE  |
|---|---|
| <b>Chair: Thibaut Le Bertre</b> , Observatoire de Paris - LERMA<br>Ouali Acef, Observatoire de Paris - SYRTE<br>G rard Beaudin, Observatoire de Paris - LERMA<br>Patrick Charlot, Laboratoire d'Astrophysique de Bordeaux<br>Isma l Cognard, LPCE<br>Pierre Cox, IRAM<br>Monique Dechambre, LATMOS<br>Andr  Deschamps, Observatoire de Paris - LERMA<br>Pierre Encrenaz, Acad mie des Sciences<br>Fran oise Paladian, Universit  Blaise Pascal - LASMEA<br>Karl Schuster, IRAM<br>Gilles Theureau, LPCE - USN<br>Stephen Torchinsky, Observatoire de Paris - USN<br>Wim van Driel, Observatoire de Paris - GEPI<br>Rodolphe Weber, Polytech'Orl ans - USN | <b>Chair: Andr  Deschamps</b> , Observatoire de Paris - LERMA<br>G rard Beaudin, Observatoire de Paris - LERMA<br>Maurice Bellanger, URSI-France<br>Jo l Hamelin, URSI-France<br>Thibaut Le Bertre, Observatoire de Paris - LERMA<br>Alain Sibille, URSI-France<br>Herv  Sizun, URSI-France<br>Michel Terr , Cnam<br>Ivan Thomas, Observatoire de Paris - USN<br>Joe Wiart, URSI-France |

## PRIZE

URSI and URSI-France have decided to support a PhD student paper competition with a prize of 500 euros. It will be awarded by the Scientific Committee during the workshop.

## PUBLICATIONS – EDITION

The papers will be available online on the URSI-France website:

<http://ursi-france.institut-telecom.fr>

After selection by the Scientific Committee, some authors will be invited to submit their contributions for publication either in a special issue of the "Comptes rendus Physique" of the Academy of Science or in the "Revue de l' lectricit  et de l' lectronique" (REE). Guest editor: **Andr  Deschamps**

## DATES TO REMEMBER:

- **11 March: deadline for the text submission of invited papers and communications.** For further information on paper submission see the website.
- **29 – 30 March: JS'11 Scientific Workshop.**
- **30 March:** list of the papers selected for publication by the Scientific Committee.

## REGISTRATION FEES

A **registration fee of 180  ** will be asked to each participant. It includes, among other, lunches and coffee breaks. An **80  reduced fee** will be applied to students and seniors.

**With an additional 46   you will receive the special issue** of the "Comptes rendus Physique" of the Academy of Science, that will gather the key contributions of the workshop. It will be sent to you when released, early 2011.

**Registration to the Scientific Workshop** will be made on line, **before 25 March 2011**, via the website: <https://intelligence.eu.com/bin/IA/inscr?lang=0&ref=URSI/14>

## MISCELLANEOUS

All information relating to the JS'11 Scientific Workshop can be found on the website of URSI-France:

<http://ursi-france.institut-telecom.fr>