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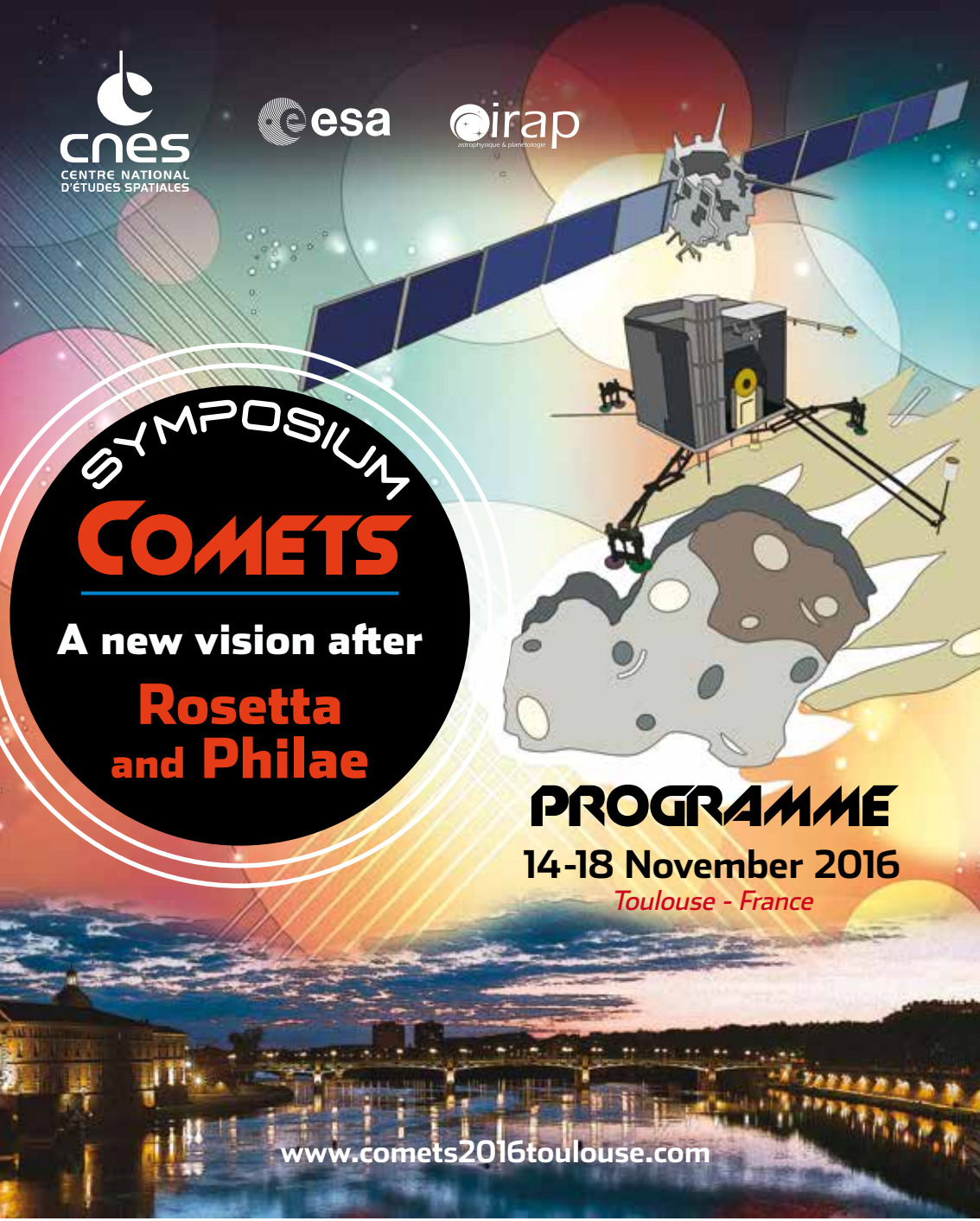

# SYMPOSIUM COMETS

## A new vision after Rosetta and Philae

# PROGRAMME

**14-18 November 2016**

*Toulouse - France*

www.comets2016toulouse.com

cnrs

Observatoire Midi-Pyrénées OMP

Université Toulouse III Paul Sabatier

Mairie de Toulouse

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# WELCOME

The international conference on cometary science entitled «Comets: A new vision after Rosetta/Philae» will be held from November 14 to 18, 2016 in Toulouse, France. The conference is principally organized by the teams involved in the Rosetta mission, the European Space Agency (ESA), the French Space Agency (CNES) and the Institute of Research in Astrophysics and Planetology (IRAP).

This conference is the latest in a series of international meetings intended to promote the exchange of knowledge and ideas among cometary scientists, with a view to integrate them in a comprehensive understanding of comets after the in-depth studies of Rosetta, Philae and other space missions and ground-based observations. In recognition of the broad scope, interdisciplinary nature, and strong international interest in this topic, we welcome the participation of any interested scientist with relevant theoretical, numerical, experimental, or observational experience.

One goal of this meeting is to generate a comprehensive global understanding of comets that will serve as an important resource for future studies. Reports on the discussions of the conference will be published at a later time.

The 46th Rosetta Science Working Team technical session will be held on Friday.

Welcome to the COMETS2016 Conference !

# COMMITTEES

## Scientific Organising Committee

N. Altobelli (ESA)
S. Besse (ESA)
J.P. Bibring (Chair, IAS)
B. Buratti (JPL)
C. Engrand (CSNSM)
P. Feldman (JHU)
M. Fulchignoni (LESIA)
M. Fulle (OATS)
E. Grün (MPI)
A. Guilbert-Lepoutre (UTINAM)
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A.C. Levasseur-Regourd (LATMOS)
K. Mandt (SwRI)
K. Meech (NAI)
A. Morbidelli (OCA)
O. Mousis (LAM)
G. Quitte (IRAP)
H. Rème (IRAP)
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M. Taylor (Chair, ESA)
C. Vallat (ESA)
C. Walsh (Leiden Observatory)
P. Weissman (PSI)

## Local Organising Committee

L. Amen (CNES)
M. Blanc (IRAP)
M. Cloup (IRAP)
L. D'Uston (IRAP)
J. Durand (CNES)
S. Etcheverry (OMP)
Ph. Garnier (IRAP)
Ph. Gaudon (Chair, CNES)
D. Granat (IRAP)
M. Hoang (IRAP)
J. Lasue (Chair, IRAP)
C. Mazelle (IRAP)
N. Murdoch (ISAE)
D. Roma (IRAP)
M. Toplis (IRAP)
D. Toublanc (IRAP)

# PROGRAMME

| MONDAY, NOV. 14 | |
|---|---|
| 11:00 | Registration |
| 12:30 | LUNCH |
| 14:00 | Welcome and Highlights |
| 14:15 | INSTRUMENTS |
| 15:35 | COFFEE |
| 16:05 | INSTRUMENTS |
| 17:45 | END |

| TUESDAY, NOV. 15 | |
|---|---|
| 8:30 | INSTRUMENTS |
| 10:20 | COFFEE |
| 10:55 | Topic 1 : Nucleus surface and interior |
| 12:25 | LUNCH |
| 14:10 | Topic 3 : Cometary comae (Composition and physical properties ; Solar wind interactions) |
| 14:25 | Topic 1 : Nucleus surface and interior |
| 15:55 | Topic 2 : Process of cometary activity and nucleus-inner coma interaction |
| 16:45 | COFFEE + POSTERS |
| 18:45 | END |
| 19:30 | Conference Dinner |

# PROGRAMME

| WEDNESDAY, NOV. 16 | |
|---|---|
| 8:30 | Topic 2 : Process of cometary activity and nucleus-inner coma interaction |
| 10:25 | COFFEE |
| 11:05 | Topic 2 : Process of cometary activity and nucleus-inner coma interaction |
| 11:20 | Topic 3 : Cometary comae (Composition and physical properties ; Solar wind interactions) |
| 12:25 | LUNCH |
| 14:10 | Topic 1 : Nucleus surface and interior |
| 14:25 | Topic 3 : Cometary comae (Composition and physical properties ; Solar wind interactions) |
| 16:45 | COFFEE + POSTERS |
| 18:45 | END |

| THURSDAY, NOV. 17 | |
|---|---|
| 8:30 | Topic 3 : Cometary comae (Composition and physical properties ; Solar wind interactions) |
| 10:25 | COFFEE |
| 10:55 | Topic 4.1 : Formation of the solar system and origins of cometary reservoirs (Chemistry ; Dynamics) |
| 12:25 | LUNCH |
| 14:10 | Topic 4.1 : Formation of the solar system and origins of cometary reservoirs (Chemistry ; Dynamics) |
| 16:00 | COFFEE + POSTERS |
| 16:30 | Topic 4.1 : Formation of the solar system and origins of cometary reservoirs (Chemistry ; Dynamics) |
| 18:15 | Topic 3 : cometary comae (composition and physical properties ; solar wind interactions) |
| 18:45 | END |

| FRIDAY, NOV 18 | |
|---|---|
| 8:30 | Topic 4.2 : Connections between comets and small bodies in the solar system (Dwarf planets (Pluto, Ceres) ; KBOs, Meteorites and Asteroids) |
| 10:15 | COFFEE |
| 10:45 | Topic 4.2 : Connections between comets and small bodies in the solar system (Dwarf planets (Pluto, Ceres) ; KBOs, Meteorites and Asteroids) |
| 11:35 | Topic 5 : New and un-resolved questions in cometary science and how to resolve them |
| 12:35 | LUNCH |
| 14:00 | SWT |
| 16:00 | COFFEE + POSTERS |
| 16:30 | SWT |
| 18:00 | END |

# DETAILED PROGRAMME

| MONDAY NOV. 14 | | |
|---|---|---|
| 14:00 | Welcome and Highlights | |
| INSTRUMENTS | | |
| 14:15 | Joel Parker / Alan Stern<br>Southwest Research Institute | ALICE |
| 14:35 | Jean-Pierre Bibring<br>Institut d'Astrophysique Spatiale | CIVA |
| 14:45 | Wlodek Kofman<br>Univ. Grenoble Alpes | CONSERT |
| 15:05 | Fred Goesmann<br>Max Planck Institute for Solar System Research | COSAC |
| 15:15 | Martin Hilchenbach<br>Max-Planck-Institut für Sonnensys-temforschung | COSIMA |
| 15:35 | COFFEE BREAK | |
| 16:05 | Alessandra Rotundi<br>Università Parthenope | GIADA |
| 16:25 | Mark Bentley<br>Space Research Institute<br>of the Austrian Academy of Sciences | MIDAS |
| 16:45 | Mark Hoftstadter<br>California Institute of Technology | MIRO |
| 17:05 | Tilmna Spohn<br>DLR-Institut für Planetenforschung | MUPUS |
| 17:15 | Holger Sierks<br>Max Planck Institute for Solar System Research | OSIRIS |
| 17:35 | Ian Wright<br>Department of Physical Sciences,<br>The Open University | Ptolemy |
| 17:45 | END | |

# DETAILED PROGRAMME

| TUESDAY NOV 15 - MORNING | | |
|---|---|---|
| **INSTRUMENTS** | | |
| 08:30 | Stefano Mottola, et al.<br>German Aerospace Center | ROLIS |
| 08:40 | Hans-Ulrich Auster<br>Institut für Geophysik und extraterrestrische Physik, | ROMAP |
| 08:50 | Katherine Altwegg<br>Space Research and Planetary Sciences, | ROSINA |
| 09:10 | Chris Carr<br>Space and Atmospheric Physics Group | RPC |
| 09:30 | Martin Pätzold<br>Rheinisches Institut für Umweltforschung an der Universität zu Köln | RSI |
| 09:50 | Martin Knapmeyer<br>DLR Institute for Planetary Research | SESAME |
| 10:00 | Fabricio Capaccioni<br>INAF-IAPS, Istituto di Astrofisica e Planetologia Spaziali | VIRTIS |
| 10:20 | COFFEE BREAK | |
| **TOPIC 1 : NUCLEUS SURFACE AND INTERIOR** | | |
| 10:55 | Ciarletti Valerie<br>LATMOS/IPSL, UVSQ Université Paris-Saclay | Probing the interior of 67P/ Churyumov-Gerasimenko |
| 11:20 | Marty Bernard<br>CRPG-CNRS, Université de Lorraine | Cometary noble gases measured by the Rosetta orbiter spectrometer for Ion and Neutral Analysis (ROSINA): planetary implications |
| 11:35 | Fornasier Sonia<br>LESIA | The 67P/Churyumov-Gerasimenko nucleus spectroscopic properties and their evolution over time |
| 12:00 | Prialnik Dina<br>Department of Geosciences, Tel Aviv University | Modeling comet nuclei, with emphasis on outburst activity |
| 12:25 | LUNCH BREAK | |

# DETAILED PROGRAMME

| TUESDAY NOV 15 - AFTERNOON | | |
|---|---|---|
| TOPIC 3 : COMETARY COMAE (COMPOSITION AND PHYSICAL PROPERTIES ; SOLAR WIND INTERACTIONS) | | |
| 14:10 | Biver Nicolas<br>LESIA, Observatoire de Paris | The heliocentric and time variation of the release of molecules by 67P/Churyumov-Gerasimenko as seen by MIRO |
| TOPIC 1 : NUCLEUS SURFACE AND INTERIOR | | |
| 14:25 | Bardyn Anaïs<br>LISA/LPC2E | Cometary dust composition and its variation as seen by COSIMA over nearly two years of the Rosetta mission |
| 14:40 | Davidsson Bjorn<br>Jet Propulsion Laboratory, California Institute of Technology | Large Scale Morphological Changes in the Hapi Region on Comet 67P/ Churyumov-Gerasimenko |
| 14:55 | Filacchione Gianrico<br>INAF-IAPS, Rome, IT | Compositional maps of 67P/CG nucleus surface after perihelion passage by Rosetta/VIRTIS |
| 15:10 | Moroz Lyuba<br>Institute of Earth and Environmental Science, University of Potsdam | Laboratory spectral VNIR studies supporting VIRTIS' nucleus surface composition analysis of 67P/CG and prospects for future observations |
| 15:25 | Kargl Günter<br>Space Research Institute, Austrian Academy of Sciences | Irradiation and thermal environment of the Abydos region on comet 67P |
| 15:40 | Rousseau Batiste<br>LESIA - Observatoire de Paris | Sulfides and refractory organic matter at the surface of 67P/Churyumov-Gerasimenko: evidence from VIRTIS data and laboratory measurements |
| TOPIC 2 : PROCESS OF COMETARY ACTIVITY AND NUCLEUS-INNER COMA INTERACTION | | |
| 15:55 | Combi Michael<br>University of Michigan | Modeling Comet Activity: Connecting In Situ and Remote Sensing Measurements |
| 16:20 | Hansen Kenneth<br>University of Michigan | The Evolution of Water Production of Comet 67P/Churyumov-Gerasimenko Throughout the Rosetta Mission: Insights from Modeling and Rosetta Data |
| 16:45 | POSTER SESSION + Coffee break | |
| 18:45 | END | |
| 19:30 | CONFERENCE DINNER | |

| WEDNESDAY NOV 16 - MORNING | | |
|---|---|---|
| TOPIC 2 : PROCESS OF COMETARY ACTIVITY AND NUCLEUS-INNER COMA INTERACTION | | |
| 08:30 | Vincent Jean-Baptiste, et al.<br>MPS/OCA | Coma features, related activity sources, and surface evolution |
| 08:55 | Bockelee-Morvan Dominique<br>Observatoire de Paris | Seasonal evolution of comet 67P activity from Rosetta/VIRTIS-H observations |
| 09:10 | Keller Horst Uwe<br>Institut für Geophysik und extraterrestrische Physik (IGEP) U. Braunschweig | Seasonal back fall of dust on the northern hemisphere of 67P: observational evidence and consequences for the nucleus evolution |
| 09:25 | Langevin Yves<br>Institut d'Astrophysique Spatiale, CNRS / Univ. Paris Sud | Typology of cometary particles collected by COSIMA during the orbital phase of Rosetta (August 2014 – September 2016) |
| 09:40 | Gicquel Adeline<br>MPS | Modelling of the outburst on July 29th, 2015 observed with OSIRIS in the southern hemisphere of comet 67P/ Churyumov-Gerasimenko |
| 09:55 | Ninio Greenberg Adi<br>Tel Aviv University | The Effect of CO2 on Gas Trapping in Cometary Ices |
| 10:10 | Shi Xian<br>Max-Planck Institute for Solar System Research | Dust emission around terminators observed by OSIRIS sheds light on the diurnal cycle of activity on 67P/ Churyumov-Gerasimenko |
| 10:25 | POSTER SESSION + Coffee break | |
| 11:05 | Capria Maria Teresa<br>INAF/IAPS | Dust grains in the coma of 67P/Churyu-mov-Gerasimenko – link with surface properties and cometary activity |
| TOPIC 3 : COMETARY COMAE (COMPOSITION AND PHYSICAL PROPERTIES ; SOLAR WIND INTERACTIONS) | | |
| 11:20 | Coates Andrew<br>Mullard Space Science Laboratory | Cometary plasma boundaries |
| 11:45 | Stenberg Wieser Gabriella, et al.<br>Swedish Institute of Space Physics | Plasma boundaries around comet 67P |
| 12:10 | A'Hearn Michael<br>University of Maryland | Diurnal and Annual Variation of CO Emission from 67P/Churyumov-Gerasimenko |
| 12:25 | Lunch break | |

| WEDNESDAY NOV 16 - AFTERNOON | | |
|---|---|---|
| TOPIC 1 : NUCLEUS SURFACE AND INTERIOR | | |
| 14:10 | Herique Alain<br>IPAG | Cosmochemical implications of CONSERT permittivity characterization of 67P/CG |
| TOPIC 3 : COMETARY COMAE (COMPOSITION AND PHYSICAL PROPERTIES ; SOLAR WIND INTERACTIONS) | | |
| 14:25 | Della Corte Vincenzo<br>IAPS-INAF | Temporal variation in dust environment as measured by GIADA |
| 14:40 | FRAY Nicolas<br>LISA, UMR 7583 du CNRS, UPEC and UPD | Characterization of the refractory organic matter present in the dust particles of 67P/Churyumov-Gerasimenko. |
| 14:55 | Migliorini Alessandra<br>IAPS-INAF | CN and OH emissions in the 67P/Churyumov-Gerasimenko coma with Rosetta/VIRTIS-M spectrometer |
| 15:10 | Goetz Charlotte<br>Technische Universität Braunschweig | A review of the magnetic field at comets |
| 15:25 | Wurz Peter<br>University of Bern | Solar Wind Sputtering of Dust on the Surface of 67P/Churyumov-Gerasimenko |
| 15:50 | Gasc Sébastien<br>Physikalisches Institut, University of Bern | Change of outgassing pattern during the March 2016 equinox as seen by ROSINA/RTOF |
| 16:05 | Agarwal Jessica<br>Max-Planck-Institut fuer Sonnensystemforschung | Dynamics of decimetre-sized aggregates in the coma of 67P/Churyumov-Gerasimenko |
| 16:30 | Geiger Bernhard<br>Aurora Technology B.V., ESA/ESAC | Properties of Dust Particles in the Comet Environment around the Rosetta Spacecraft |
| 16:45 | POSTER SESSION + Coffee break | |
| 18:45 | End | |

| THURSDAY NOV 17 - MORNING | | |
|---|---|---|
| TOPIC 3 : COMETARY COMAE (COMPOSITION AND PHYSICAL PROPERTIES ; SOLAR WIND INTERACTIONS) | | |
| 08:30 | Westphal Andrew<br>UC Berkeley | Towards synthesis of in situ and laboratory observations of cometary materials |
| 08:55 | Ivanova Oleksandra<br>Astronomical Institute of Slovak Academy of Sciences | Spectroscopy of comet 67P/Churyumov-Gerasimenko at the 6-m telescope of the SAO RAS |
| 09:10 | Simon Wedlund Cyril<br>Department of Physics, University of Oslo | Gas production rate of Comet 67P/C-G derived from in situ measurements by the Rosetta plasma instruments |
| 09:25 | Hoang Margaux<br>Institut de recherche en astrophysique et planétologie | Variability of 67P coma major composition as seen by ROSINA RTOF |
| 09:40 | Heritier Kevin<br>Imperial College Student | Ion composition in the coma of 67P - model vs. DFMS comparison |
| 09:55 | Goldstein Raymond<br>Southwest Research Institute | Two Years of Solar Wind and Pickup Ion Measurements at Comet 67P/ Churyumov-Gerasimenko |
| 10:10 | Bodewits Dennis<br>University of Maryland in College Park | Physical reactions in the inner coma of 67P between 3 AU before and after its perihelion. |
| 10:25 | Coffee break | |
| TOPIC 4.1 : FORMATION OF THE SOLAR SYSTEM AND ORIGINS OF COMETARY RESERVOIRS (CHEMISTRY ; DYNAMICS) | | |
| 10:55 | Blum Jürgen<br>IGeP, TU Braunschweig | The formation of comet 67P - lessons learnt by Rosetta |
| 11:20 | Brown John C<br>U. Glasgow | What can White Dwarf Pollution by infalling Debris tell us about Solar and exo-Comets |
| 11:45 | Drozdovskaya Maria<br>Leiden Observatory | Dynamic assembly of cometray ices in protoplanetary disk midplanes |
| 12:00 | Ceccarelli Cecilia<br>Institut de Planétologie et d'Astrophysique de Grenoble | The astrochemical protostellar-comet link |
| 12:25 | Lunch break | |

| THURSDAY NOV 17 - AFTERNOON | | |
|---|---|---|
| TOPIC 4.1 : FORMATION OF THE SOLAR SYSTEM AND ORIGINS OF COMETARY RESERVOIRS (CHEMISTRY ; DYNAMICS) | | |
| 14:10 | Nagahara Hiroko<br>Department of Earth and Planetary Science, The University of Tokyo | Radial mixing of high- and low-temperature components of comets in the protoplanetary disk |
| 14:25 | Meech Karen<br>Institute for Astronomy | Nearly Inactive Long-Period (Manx) Comets and Their Role in Understanding Solar System Formation |
| 14:40 | Elsila Jamie<br>NASA Goddard Space Flight Center | Amino Acids in the Solar System |
| 15:05 | Mumma Michael<br>NASA Goddard Space Flight Center | Native Volatiles in 67P in the Context of a Taxonomic Survey of 30 comets: Chemical and Isotopic Signatures, and Their Cosmic Implications |
| 15:20 | Michel Patrick<br>Laboratoire Lagrange, Université Côte d'Azur, Observatoire de la Côte d'Azur, CNRS, Nice, France | Disruptive collisions as the origin of 67P/C-G (and small bilobate comets) |
| 15:35 | Johansen Anders, et al.<br>Lund University | The role of comets in planet formation |
| 16:00 | Coffee break | |
| 16:30 | Klahr Hubert<br>Max-Planck Institut für Astronomie | Formation of Comets via gravoturbulent fragmentation of pebble clouds |
| 16:55 | Morbidelli Alessandro<br>Observatoire de la Cote d'Azur | How primordial is the structure of comet 67P/C-G (and of comets in general)? |
| 17:20 | Zhang Ke<br>University of Michigan | New insight of chemistry in protoplanetary disks in the age of ALMA |
| 17:45 | Mannel Thurid<br>Space Research Institute of the Austrian Academy of Sciences | The morphology and growth of cometary dust at the micrometre scale |
| 18:00 | Laufer Diana<br>Tel Aviv University | Trapping Mechanism of O2 in Water Ice as First Measured by Rosetta Spacecraft |
| 18:15 | Engrand Cecile<br>CSNSM CNRS/Univ. Paris Sud, Univ. Paris-Saclay | Analyses of cometary dust: from space to the laboratory |
| 18:30 | End | |

| FRIDAY NOV 18 | | |
|---|---|---|
| TOPIC 4.2 : CONNECTIONS BETWEEN COMETS AND SMALL BODIES IN THE SOLAR SYSTEM (DWARF PLANETS (PLUTO, CERES) ; KBOS, METEORITES AND ASTEROIDS) | | |
| 08:30 | Barucci Maria Antonietta<br>LESIA - Paris Observatory | Relations among TNOs, comets, and asteroids |
| 08:55 | De Sanctis Maria Cristina<br>Istituto di Astrofisica e Planetologia Spaziale INAF | New light on ceres: dawn results |
| 09:20 | Jewitt David<br>Deparment of Earth and Space Sciences, UCLA | From Kuiper Belt to Comet |
| 09:45 | Levasseur-Regourd Anny-Chantal, et al.<br>LATMOS-IPSL, Université Pierre et Marie Curie | Linking cometary and zodiacal dust: Evidences from the Rosetta mission |
| 10:00 | Mandt Kathleen<br>Southwest Research Institute | The role of comets in understanding the evolution of nitrogen in solar system atmospheres |
| 10:15 | Coffee break | |
| 10:45 | Parker Joel<br>Southwest Research Institute | New Horizons Results at the Pluto System<br>in Relation to Comets |
| 11:10 | Remusat Laurent<br>Institut de Minéralogie, Physique des Matériaux et Cosmochimie - CNRS / MNHN / UPMC / IRD | In situ Study of Organic Molecules in Primitive Meteorites |
| TOPIC 5 : NEW AND UN-RESOLVED QUESTIONS IN COMETARY SCIENCE AND HOW TO RESOLVE THEM | | |
| 11:35 | Fulle Marco<br>INAF - Osservatorio Astronomico di Trieste | Unexpected and Significant Findings in 67P: the latest news |
| 12:00 | Snodgrass Colin<br>The Open University | Current results and future prospects for remote sensing of comets |
| 12:25 | Final comments | |
| 12:35 | End / Lunch break | |
| 14:00 | SCIENCE WORKING TEAM TECHNICAL SESSION | |
| 16:00 | Coffee break | |
| 16:30 | SCIENCE WORKING TEAM TECHNICAL SESSION | |
| 18:00 | End | |

# NOTES

# NOTES

## TOPIC 1 : NUCLEUS SURFACE AND INTERIOR

**01 - Why are Comets so Dark?**
Buratti Bonnie, Jet Propulsion Laboratory, California Institute of Technology

**02 - VIRTIS observations of the nucleus of 67P/Churyumov-_ Gerasimenko at low phase angle**
Ciarniello Mauro, IAPS-INAF

**03 - Evolution of 67P/Churyumov-Gerasimenko's FUV Surface Properties through its 2015 Perihelion Passage**
Feaga Lori, University of Maryland

**04 - Material strength and it influence on cliff stability on 67P/ Churyumov-Gerasimenko**
Hofmann Marc, Max-Planck-Institut für Sonnensystemforschung

**05 - Constraints for the subsurface structure at the Abydos site on 67P/Churyumov-Gerasimenko resulting from CASSE listening to the MUPUS insertion phase**
Knapmeyer Martin, DLR

**06 - Photometric behavior of 67P spectral parameters and analysis of its diurnal variations**
Longobardo Andrea, IAPS-INAF

**07 - Temporal variation of long-lived water ice rich features observed on comet 67P/Churyumov-Gerasimenko via OSIRIS NAC multispectral images**
Oklay Nilda, MPS

**08 - Beyond CONSERT: Satellite-Based Radio Tomography for a Small Planetary Object**
Pursiainen Sampsa, et al. , Tampere University of Technology

**09 - The temporal evolution of exposed water ice-rich areas on the surface of 67P/Churyumov-Gerasimenko: spectral analysis**
Raponi Andrea, INAF - IAPS

**10 - Local study of photometric variations at comet 67P/Churyumov-Gerasimenko: a point of view from VIRTIS/Rosetta**
Rousseau Batiste, LESIA - Observatoire de Paris

**11 - Recovery of Comet Nucleus Interior: Hardware Constraints in Future Radio Tomography Applications**
Takala Mika, Tampere University of Technology

## TOPIC 2 : PROCESS OF COMETARY ACTIVITY AND NUCLEUS-INNERCOMA INTERACTION

**12 - Radiogenic Volcanism of Primordial Comet Interiors**
Arias Francisco J, et al., Universitat Politecnica de Catalunya, University of Cambridge

**13 - Comet Nucleus : Sublimation of Multicomponent Ices**
Bouziani Naceur, CRAAG Observatoire d'Alger

**14 - Comet 67P Nucleus Water Ice Surface Distributions Retrieved from Rosetta/MIRO Observations**
Lee Seungwon, Jet Propulsion Laboratory

**15 - Coma features of the comet 67P/C-G in polarimetric context: observations from Rozhen observatory**
Nikolov Plamen, Institute of Astronomy and NAO, BAS

**16 - Study of the Comets C/2012 S1(Ison) and C/2013 A1(Siding Spring)**
Vodniza Alberto Quijano, et al., University Of Narino Observatory

**17 - The Forecasting of the Near-Nucleus Gas Coma of Comet 67P Prior to the Descent of PHILAE**
Zakharov Vladimir, Laboratoire de Meteorologie Dynamique, Universite Pierre et Marie Curie

## TOPIC 3 : COMETARY COMAE (COMPOSITION AND PHYSICAL PROPERTIES ; SOLAR WIND INTERACTIONS)

**18 - Comets in the Young Solar System: First Results from Hybrid Plasma Modelling**
Alho Markku, Aalto University

**19 - Europlanet H2020 Planetary Space Weather Services for Cometary Science**
Andre Nicolas, CNRS/IRAP

**20 - A simple model of the solar wind flow around 67P/CG based on the Rosetta Plasma Consortium Ion Composition Analyzer (RPC-ICA) observations**
Behar Etienne, Swedish Institute of Space Physics

**21 - Mass-loading of the solar wind around 67P/CG as seen by the Rosetta Plasma Consortium Ion Composition Analyzer (RPC-ICA)**
Behar Etienne, Swedish Institute of Space Physics

**22 - Modelling of the Plasma Environment Surrounding 67p: What Is the Effect of the Convective Electric Field on Ion Density Profiles?**
Beth Arnaud, Imperial College London

**23 - The inventory of molecular abundances in comets from mm/submm molecular surveys**
Biver Nicolas, LESIA, Observatoire de Paris

**24 - The Spatial Profile of Cometary Suprathermal Electrons**
Broiles Thomas, Southwest Research Institute

**25 - 2D-photochemical model for forbidden oxygen line emission for comets 1P/Halley and 67P/ Churyumov-Gerasimenko**
Cessateur Gaël, BIRA-IASB

**26 - Hydrogen Halides In The Coma Of 67P**
Dhooghe Frederik, Royal Belgian Institute for Space Aeronomy (BIRA-IASB)

**27 - Plasma Density Variations and Waves in the Inner Coma of Comet 67P**
Eriksson Anders, Swedish Institute of Space Physics

**28 - Modeling the Major Volatiles in the Coma of Comet 67P/ Churyumov-Gerasimenko Constrained by Rosetta Observations**
Fougere Nicolas, University of Michigan

**29 - Rosetta Plasma Consortium data access and analysis facilitated by CDPP tools**
Génot Vincent, IRAP, CNRS & Université Paul Sabatier, Toulouse

**30 - Properties of Dust Particles by Polarimetric Observations of Split Comets Revisited using Ground-Truth from Rosetta Experiments**
Hadamcik Edith, LATMOS/CNRS

**31 - Plasma response to a cometary outburst: Rosetta Plasma Consortium observations during comet 67P/Churyumov-Gerasimenko outburst event on 19 February 2016**
Hajra Rajkumar, LPC2E - CNRS

**32 - A possible explanation of magnetic field dropouts observed by RPC-MAG in the inner coma of comet 67P/Churyumov-Gerasimenko**
Huang Zhenguang, University of Michigan

**33 - Photometry and spectroscopy of the comet C/2013 X1 PanSTARRS**
Husarik Marek, Astronomical Institute of the Slovak Academy of Sciences

**34 - Analysis of the 67P/Churyumov-Gerasimenko dusty environment during the perihelion using aspherical dust dynamical simulations constrained by GIADA measurements.**
Ivanovski Stavro L., INAF- IAPS Istituto di Astrofisica e Planetologia Spaziali

**35 - Influence of charge separation on solar wind deflection: electrostatic PIC-modeling of a small comet**
Jesper Lindkvist, Umeå University

**36 - Langmuir Probe and Mutual Impedance Probe Plasma Measurements of Comet 67P in Comparison to Spacecraft-Plasma Interaction Simulations**
Johansson Fredrik, Swedish Institute of Space Physics

**37 - Simulation of the near-surface dust charging and transport on 67P Churyumov-Gerasimenko**
Matéo Vélez, ONERA

**38 - Dust Particle flux measured in-situ by Rosetta/COSIMA**
Merouane Sihane, Max-Planck Institute for Solar System Research

**39 - Observatory High Resolution Optical Spectroscopy of Rosetta Target 67P/Churyumov-Gerasimenko Using Keck HIRES**
McKay Adam, Univeristy of Texas Austin/McDonald

**40 - Measurements of the Rosetta spacecraft potential and evolution of the cometary plasma environment of 67P**
Odelstad Elias, Swedish Institute of Space Physics

**41 - Dust properties in the coma of 67P/Churyumov-Gerasimenko as observed by VIRTIS-M and GIADA**
Rinaldi Giovanna, IAPS-INAF

**42 - Photometry and polarimetry of comet 67P/Churyumov-Gerasimenko at the 6-m telescope of the SAO RAS**
Rosenbush Vera, Main Astronomical Observatory of the National Academy of Sciences of Ukraine

**43 - The Disk-Comet Connection and Comet C/2012 K1 (PanSTARRS)**
Roth Nathan, Department of Physics & Astronomy, University of Missouri-St. Louis

**44 - Properties of cometary dust down to the nanometre scale**
Schmied Roland, Space Research Institute, Austrian Academy of Sciences

**45 - Reactive collisions of electrons with molecular cations in cometary atmospheres**
Schneider Ioan F., Normandie Université, University of Le Havre, LOMC-CNRS-UMR-6294

**46 - Role of photoionisation, charge-exchange and electron ionisation on cometary plasma environments: application to 67P/C-G at perihelion**
Simon Wedlund Cyril, Department of Physics, University of Oslo

**47 - Short time-scale variations in the ion environment around 67P**
Stenberg Wieser Gabriella, et al., Swedish Institute of Space Physics

**48 - Dust distribution in a jet observed by Rosetta VIRTIS-M in a coma of comet 67P/Churyumov-Gerasimenko on April 14, 2015**
Tenishev Valeriy, University of Michigan

**49 - The ionization balance in the innermost coma of 67P**
Vigren Erik, Swedish Institute of Space Physics

**50 - Field line draping and current sheets in comet 67P/Churyumov-Gerasimenko's coma**
Vowerk Martin, Space Research Institute, Austrian Academy of Sciences

## TOPIC 4.1 : FORMATION OF THE SOLAR SYSTEM AND ORIGINS OF COMETARY RESERVOIRS (CHEMISTRY ; DYNAMICS)

**51 - What did Rosetta tell us about the formation of Jupiter ?**
Ali-Dib Mohamad, CPS/University of Toronto

**52 - About the O2/H2O abundances ratios observed in comet 67P/Churyumov-Gerasimenko**
Ellinger Yves, Université P. & M. Curie - Paris 06

**53 - Understanding the Early Solar System via Synergy between Comets and Protoplanetary Disk Models**
Gibb Erika, University of Missouri - St. Louis

**54 - Assessing the Primordial Character of Comets and of 67P/ Churyumov-Gerasimenko**
Jockers Klaus, Max-Planck-Institute for Solar System Research

**55 - Impact of radiogenic heating on the formation conditions of comet 67P/Churyumov-Gerasimenko**
Mousis Olivier, Laboratoire d'Astrophysique de Marseille

**56 - Formation of pebble-pile planetesimals - the internal structure of comets**
Wahlberg Jansson Karl , et al. , Lund Observatory

## TOPIC 4.2 : CONNECTIONS BETWEEN COMETS AND SMALL BODIES IN THE SOLAR SYSTEM (DWARF PLANETS (PLUTO, CERES) ; KBOS, METEORITES AND ASTEROIDS)

**57 - Texture analysis of IPDs and comparison to 67P dust particles**
Lasue Jeremie, IRAP-OMP

**58 - Modeling the Dielectric Properties of Comet 67P/CG Based on Observations by RosettaÕs CONSERT and VIRTIS Instruments**
Palmer Elizabeth, Western Michigan University

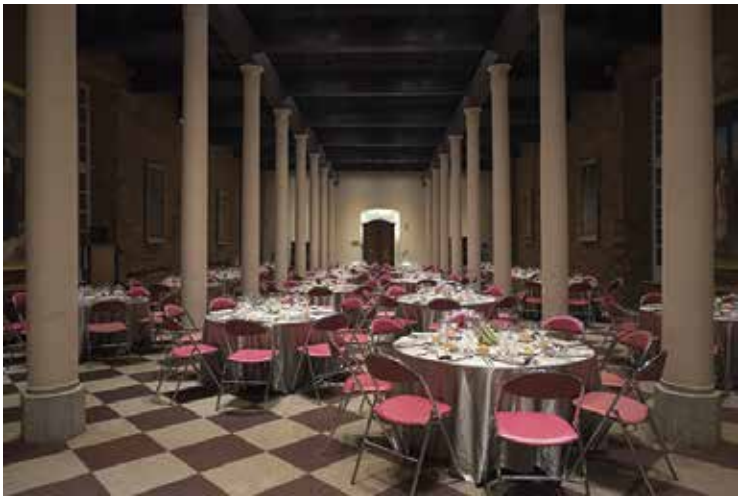
**59 - Comparing Regolith Surface Roughness on Comet 67P/CG and Asteroid Vesta: Implications for Radar Observations by the Rosetta and Dawn Missions**
Palmer Elizabeth, Western Michigan University

## TOPIC 5 : NEW AND UN-RESOLVED QUESTIONS IN COMETARY SCIENCE AND HOW TO RESOLVE THEM

**60 - The new Planetary Science Archive (PSA): Exploration and discovery of scientific datasets from the Rosetta mission**
Besse Sebastien, ESA

**61 - Comets and Astrobiology, (re)assessment for comet 67P after ROSETTA**
COTTIN Hervé, LISA/UPEC

# NOTES



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The COMETS2016 Symposium dinner will be held on Tuesday Oct. 15 at the Hôtel-Dieu Saint-Jacques

Starting time : 19 :30

Venue
2 Rue de la Viguerie
31300 Toulouse

## Access

Walking distance from the Abattoirs museum : 10 mins.

Metro A St Cyprien (take the «rue de la République» towards the «Pont-Neuf»)
Bus lines 2, 10, 12, 14, 52, 78 and 80, stop «Cours Dillon.»

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## Welcome to Toulouse, the Pink City !

Toulouse is situated in the south of France, at the northern tip of the Haute-Garonne département, between the Mediterranean Sea and the Atlantic Ocean. The city lies on a bend in the River Garonne which, flowing down from the Pyrenees, heads north-east before changing direction in Toulouse to head north-west towards the Atlantic Ocean.

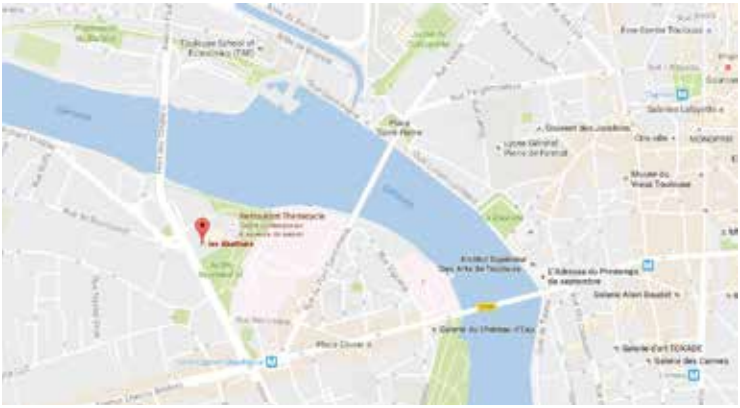
With its characteristic architecture, the city of Toulouse has earned the nickname «ville rose» or «pink city» due to the colour of the local building material traditionally used - terra cotta bricks. Toulouse is now one of Europe's high-tech cities with a large number of cutting-edge businesses in the aeronautic, IT and space industry, as well as many research institutes. It is an important university town with prestigious cultural centres.

Toulouse is undergoing rapid demographic expansion, the fastest-growing in France and, for agglomerations with more than 850,000 inhabitants, even in Europe. It is considered one of the larger intermediate European cities along with Lyon, Marseille, Florence, Hamburg and Zurich.

Toulouse was ranked by Lonely Planet among the 10 European Destinations in 2014.

## Access

The conference will take place at «Les Abattoirs», museum devoted to modern and contemporary art forms of all kinds: sculptures, paintings, photography... Operating principals of this museum: temporary exhibits and exhibitions from the permanent collection.



## Venue

76 Allée Charles de Fitte - 31300 TOULOUSE
Location : West
Phone : 05 34 51 10 60 - Fax : 05 62 48 58 01
www.lesabattoirs.org

## Public Transportation

From the Airport, Tramway T2 to Arènes and Metro A to Saint Cyprien République - 20 minutes
From the train station, Metro A to Saint Cyprien République (direct) - 10 minutes

## Prices

- Single ticket .....1.60 €
- Day Pass (Unlimited trips during 1 day) .....5.50 €
- 2 Days Pass (Unlimited trips during 2 consecutive days).....8.50 €
- 3 Days Pass (Unlimited trips during 3 consecutive days).....10.50 €

More information on http://www.tisseo.fr/en

## Restaurants nearby

The Hemicycle restaurant, located in the immediate vicinity, offers lunches for COMETS2016 participants. These lunches are available at a rate of 16€ and payable on site.

| | | |
|---|---|---|
| **Le Bistrologue**<br>2 place Ravelin | French | € |
| **Le Cyprien**<br>18 avenue Etienne Billières | French | € |
| **Carson City**<br>3 place Olivier<br>http://www.restaurant-carsoncity.fr/ | American | €€ |
| **Solaneko**<br>9 rue Réclusane<br>http://www.solaneko.fr | Japanese | € |
| **Subway**<br>16 place Olivier | Fast food | € |
| **Ytaing**<br>14 avenue Etienne Billières | Asian | € |
| **Aux Petits Frères**<br>7 place Jean Diebold | French | € |
| **Bistrot 12**<br>12 place intérieure Saint Cyprien | French | € |
| **Les bottes rouges**<br>29 Rue Viguerie | French | €€ |
| **Caffé Luce**<br>8 place Estrapade | Italian | € |

# NOTES

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CENTRE NATIONAL D'ÉTUDES SPATIALES

esa

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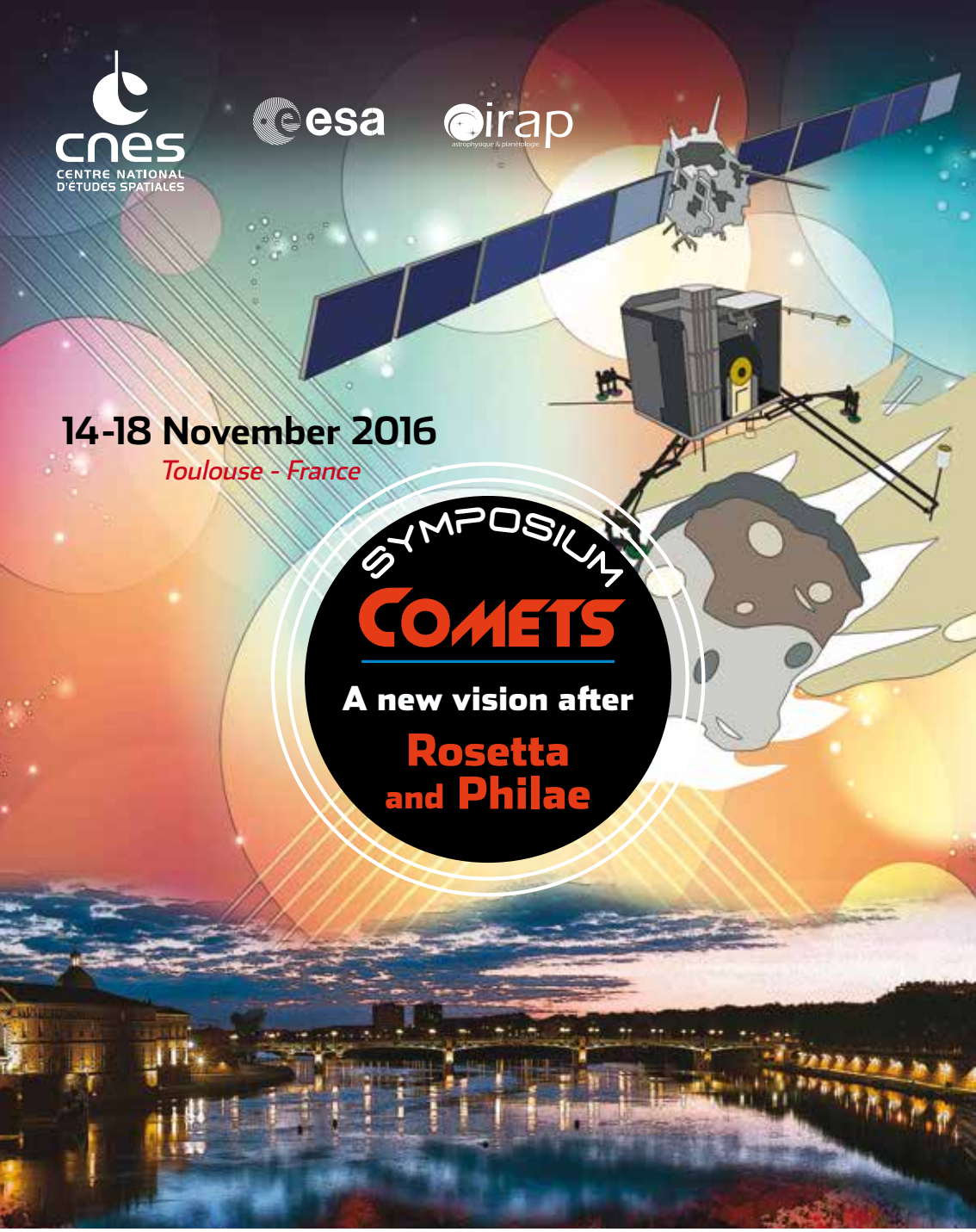
astrophysique & planétologie



# 14-18 November 2016

*Toulouse - France*

SYMPOSIUM

# COMETS

## A new vision after Rosetta and Philae

cnrs

Observatoire Midi-Pyrénées OMP

UNIVERSITÉ TOULOUSE III PAUL SABATIER

MAIRIE DE TOULOUSE