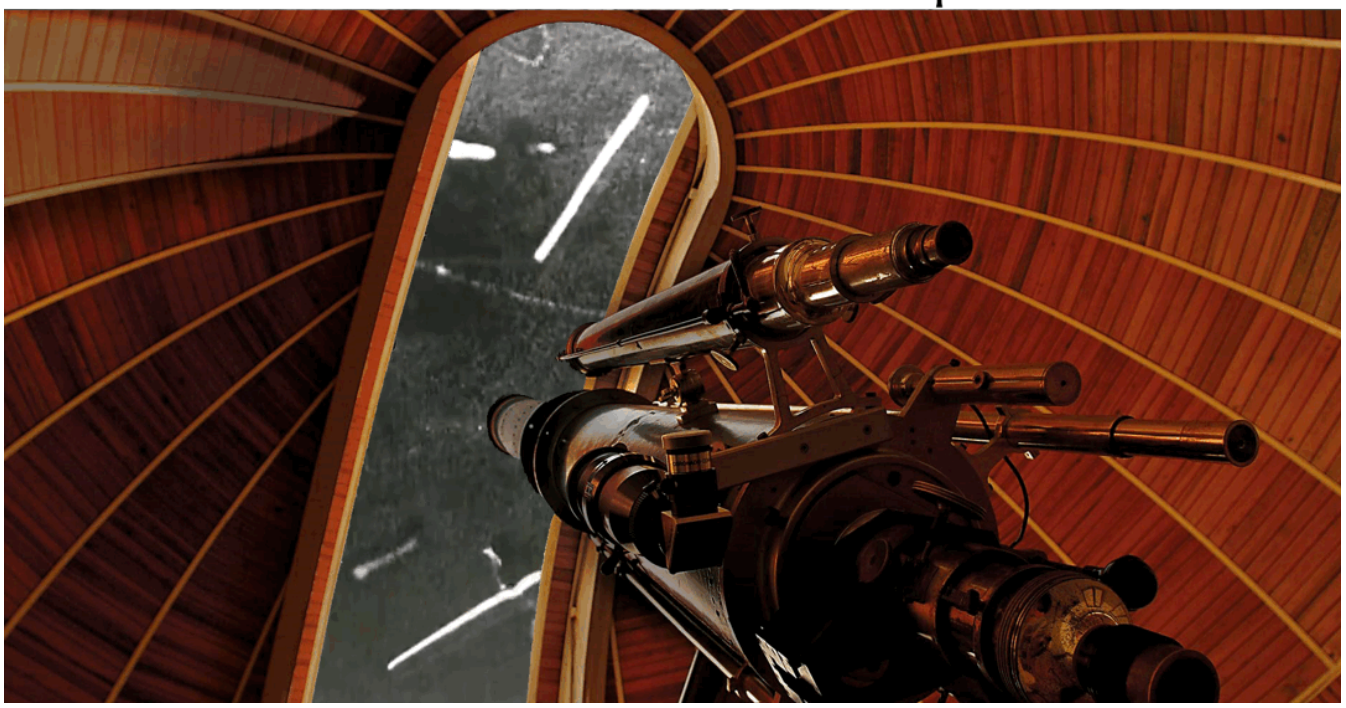
Scientific Programme

COSMIC RAYS 2

The salt of the star formation recipe



8th-10th November 2022

Arcetri, Florence, Italy

Department of Physics and Astronomy

Version 24/10/2022

Tuesday, November 8th

08:30-09:15	Registration	
09:15-09:30	Welcome and logistics	
SESSION 1-a Role of cosmic rays in star- and planet-forming regions: Theory		
Chair: Marco Padovani		
09:30-10:00	(I) Stella Offner	Impact of cosmic-ray feedback on protostellar disks
10:00:10:20	(C) Donna Rodgers-Lee	Stellar cosmic ray driven chemistry in the terrestrial planet-forming region of protoplanetary disks
10:20-10:40	(C) Ellis Owen	Empirical modelling of cosmic ray propagation in magnetised molecular cloud complexes and the impacts on the initial conditions of star-formation
10:40-11:10	Coffee break and Posters	
Chair: Stefano Bovino		
11:10-11:40	(I) Shmuel Bialy	Cold clouds as cosmic-ray detectors
11:40-12:00	(C) Thomas Geballe	Cosmic ray H2 ionization rate in the Galactic Center measured by H3+
12:00-12:20	(C) Alexandre Faure	H3+ and the cosmic-ray ionization rate in the Galactic Center: the dual role of electrons
12:20-12:40	(C) David Neufeld	The cosmic-ray ionization rate implied by observations of H3+
12:40-13:00	(C) Farhad Zadeh	High Cosmic-ray Flux in the Galactic Center Region
13:00-14:30	Lunch	
Chair: Stella Offner		
14:30-15:00	(I) Michael Küffmeier	Cosmic-rays as a regulator of disk sizes
15:00-15:20	(C) Tommaso Grassi	Modelling the propagation of cosmic rays in pre-stellar cores

15:20-15:40	(C) Alessandro Lupi	The impact of cosmic rays on the ortho-to-para ratio of H2 in star-forming filaments
15:40-16:00	(C) Vo Hong Minh Phan	How to estimate the fluctuations of the cosmic-ray induced ionization rate in the Milky Way?
16:00-16:20	(C) Andrea Bracco	The LOFAR view of the turbulent, multiphase, and magnetized ISM
16:20-16:50	Coffee break and Posters	
Chair: Giovanni Morlino		
16:50-17:10	(C) Philipp Mertsch	Self-confinement of low-energy cosmic rays around supernova remnants
Special SESSION		
17:10-17:40	(I) Lorenzo Bonechi	Use of atmospheric muons for investigations on cultural heritage: the case study of the Brunelleschi dome of the Florence Cathedral

Wednesday, November 9th

SESSION 1-b **Role of cosmic rays in star- and planet-forming regions: Observations**		
Chair: Laura Colzi		
09:00-09:20	(C) Arshia Jacob	Investigating the cosmic-ray ionisation rate in diffuse atomic clouds
09:20-09:40	(C) Erica Behrens	Tracing Cosmic Ray Heating: An ALCHEMI Measurement of HCN and HNC in NGC 253
09:40-10:00	(C) Simon Purser	Surveying cosmic ray production within the Taurus and Perseus Molecular Clouds using LOFAR
10:00-10:20	(C) Elena Redaelli	The cosmic-ray ionisation rate in the prestellar core L1544
10:20-10:50	Coffee break and Posters	
Chair: Alberto Sanna		
10:50-11:10	(C) Anaëlle Maury	Ionization, grain properties and magnetic fields in protostellar interiors
11:10-11:30	(C) Jaime E. Pineda	A Spatially Resolved map of Cosmic Ray Ionization Rate
11:30-11:50	(C) Nick Indriolo	Observations of H3+ toward the W28 and Vela Supernova Remnants
11:50-12:15	Poster presentations	
12:15-13:45	Lunch	
SESSION 2 **Cosmic rays and Astrochemistry** **(observations, models and laboratory experiments)**		
Chair: Daniele Galli		
13:45-14:15	(I) Christopher Shingledecker	Cosmic-ray bombardment of cosmic ice: From physics, to chemistry, to the seeds of life
14:15-14:45	(I) Stefano Bovino	Cosmic-ray ionization rate in star-forming regions
14:45-15:05	(C) Laura Colzi	The effect of cosmic rays on carbon isotopic fractionation

15:05-15:25	(C) Jin Zhang	Vacuum ultraviolet photo-absorption spectroscopy of space-related ice: ethanolamine under 1 keV electron irradiation
15:25-15:45	(C) Ross O'Donoghue	The Effects of Cosmic Rays on the Chemistry of Dense Cores
15:45-16:15	Coffee break and Posters	
Chair: Víctor M. Rivilla		
16:15-16:45	(I) Olli Sipilä	Revised models for cosmic ray-induced desorption in dense clouds
16:45-17:05	(C) Giovanni Sabatini	Unveiling the distribution of the cosmic-rays ionization rate with ALMA
17:05-17:25	(C) Chia-Jung Hsu (on behalf of Negar Entekhabi)	Astrochemical modelling of infrared dark clouds

20:30	**CONFERENCE DINNER**

Thursday, November 10th

SESSION 3 **Cosmic rays and the origin of Life (comets, planetary atmospheres and early Earth)**		
Chair: Anaëlle Maury		
9:00-9:30	(I) Noemie Globus	Role of polarized radiation in the origin of life
9:30-10:00	(I) Riccardo Giovanni Urso	Ion irradiation affects the composition of frozen surfaces in space
10:00-10:20	(C) Nadia Balucani	Prebiotic chemistry in the stratosphere of Titan induced by cosmic rays
10:20-10:50	Coffee break and Posters	
10:50-11:20	(I) Romain Maggiolo	Processing of cometary nuclei by cosmic rays
SESSION 4 **Local cosmic-ray factories**		
Chair: Donna Rodgers-Lee		
11:20-11:50	(I) Brandt Gaches	Aluminium-26 enrichment in the surface of protostellar disks due to protostellar cosmic rays
11:50-12:10	(C) Victoria Cabedo	Gas ionization and magnetic field coupling in B335
12:10-12:30	(C) Christian Rab	Constraining the stellar energetic particle flux of T Tauri stars
12:30-14:00	Lunch	
Chair: Alexandre Marcowith		
14:00-14:30	(I) Alberto Sanna	Radio synchrotron jets from young stars & cosmic rays: the case of G035.02+0.35
14:30-14:50	(C) Valentin Brunn	Ionisation of inner T Tauri star discs: effects of in-situ energetic particles produced by strong magnetic reconnection events
14:50-15:10	(C) Stefano Menchiari	Cosmic Ray induced ionization in dense clouds close to young massive star cluster
15:10-15:30	(C) Andrea Ciardi	Progress towards experiments of the non-resonant streaming instability
15:30-15:50	(C) Innocenza Busa	Signature of Charge-Exchange for identification of new GCRs accelerators
15:50-16:00	Final remarks	

Poster contributions

1	Anabella Araudo	The collective non-thermal emission and cosmic-ray acceleration from protostellar jets embedded in star forming regions
2	Nicholas Herrington	Magnetohydrodynamic simulations of kpc regions of spiral galaxies with feedback, and a pre-existing population of stars
3	Chia-Jung Hsu	Chemistry and Cores in Cloud Collision
4	Giada Peron	Investigating the gamma-ray counterpart of molecular clouds with enhanced ionization rate
5	Víctor M. Rivilla	Ionize Hard: Interstellar PO+ Detection
6	Alejandra Traspas Muina	Astrochemistry at Large Facilities: Systematic Investigations of Complex Organic Molecules in Space