

**Vulcano Workshop 2022**  
**Frontier Objects in AstroPhysics and Particle Physics**  
**Elba, September 26th - October 1st**

**Tentative Scientific Program**

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**Monday, September 26<sup>th</sup>**

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08:45 A. Antonelli Welcome address  
R. Fusco Femiano

**Gravitation, GW and electromagnetic counterpart**

Chair: S. Capozziello

09:00 E. Troja Multiwavelength observations of afterglow of GW counterparts (GW170817)

09:25 M.A. Papa Latest results on GW

09:50 F. Ricci Updating on GW detectors and future projects

10:15 M. Punturo Einstein Telescope

10:40 *Coffee Break*

Chair: S. Katsanevas

11:00 H. van Eerten Relativistic jets in GRB and NS mergers

11:25 M. Della Valle Observations of Kilonovae and theoretical implications

11:50 P. Ubertini Integral observations of GW and transient phenomena

12:15 I. Di Palma Multi-messenger observations, status and future perspectives

12:40 S. Mastrogiovanni Implications of BH-BH events for cosmology

13:05 A. Mangiagli LISA-Athena synergy for detecting GW and HE counterparts of supermassive binary BH mergers

13:30 *END*

13:30 *Lunch*

**Gravitation, GW and electromagnetic counterpart**

Chair: F. Ricci

17:00 S. Katsanevas GW detection at the Moon

17:25 L. Piro Athena multimessenger science

17:50 R. Peron METRIC: an Italian proposal for an atmosphere/gravity/geodesy small mission in LEO

18:15 L. Porcelli Three lunar laser ranging mission in 2023-2024 by NASA, ESA and CNSA for precision test of general relativity.

**Dark Matter**

18:40 M. Selvi Dark Matter Direct detection review

**Astrophysics/Cosmology**

19:05 R. Jimenez Cosmic concordance or discordance

19:30 *END*

20:30 *Dinner*

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**Tuesday, September 27<sup>th</sup>**

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**Astrophysics/Cosmology**

Chair: M. Punturo

09:00 B. Allen Will pulsar timing arrays observe the Hellings-Downs correlation curve?

09:25 S. Fabiani First results from IXPE

09:50 C. Pittori New results form Agile  
 10:15 F. Panessa Massive BH in AGNs: multiwavelength observations  
 10:40 *Coffee Break*

Chair: M. Teshima

11:00 R. Iuppa The CSES Space missions for investigating the near-Earth electromagnetic, plasma and particle environment  
 11:25 F. Nicastro Hot filamentary large scale structures in the universe  
 11:50 D. Jones Recent developments on measuring H0  
 12:15 A. Fontana Exploring the frontiers of Astrophysics with JWST  
 12:40 *END*  
 13:30 *Lunch*

### Astrophysics/Cosmology

Chair: C. Pittori

17:00 S. Bhandari Recent developments of Fast Radio Bursts (*remotely*)  
 17:25 A. Moiseev New Mission Concept: Compton Telescope with Coded Aperture Mask

### Cosmic Rays, Gamma Rays

17:50 M. Teshima LST program highlights  
 18:15 L. Olivera-Nieto Highlights from Gamma Ray Atmospheric Cherenkov Telescopes  
 18:40 F. Longo The Cherenkov Telescope Array: Status and perspectives  
 19:05 E. Bissaldi GRB at High Energies  
 19:30 *END*  
 20:30 *Dinner*

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## Wednesday, September 28<sup>th</sup>

### Cosmic Rays, Gamma Rays

Chair: F. Longo

09:00 R. Sparvoli Recent results on cosmic ray direct observation  
 09:25 F. Alemanno Measurement of the CR spectra with DAMPE and prospects with the HERD space mission  
 09:50 Z. Cao LHAASO results  
 10:15 O. Tibolla Observation of Ultra-High-Energy Gamma-Ray Sources with HAWC  
 10:40 *Coffee Break*

Chair: D. Jones

11:00 U. Barres The Southern Wide-Field Gamma-ray Observatory  
 11:25 M. Unger UHE cosmic ray observations  
 11:50 J. Horandel The radio detection of cosmic ray shower  
 12:15 S. Celli PeVatrons  
 12:40 M. Kachelriess Extragalactic Cosmic Ray Sources  
 13:05 *END*  
 13:30 *Lunch*

### Cosmic Rays

Chair: Z. Cao

17:00 J. Vink Cosmic Accelerators in the universe  
 17:25 H. Yan Propagation of Cosmic rays in Galactic turbulence: theory confronted with observations

### Neutrino

17:50 V. Hannen KATRIN: Upper limit on the neutrino mass  
 18:15 S. Bertolucci Neutrino physics at FNAL

18:40 M. Agostini Present and Future of Neutrinoless Double Beta Decay  
 19:05 D. D'Angelo Results from Borexino  
 19:30 *END*  
 20:30 *Dinner*

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**Thursday, September 29<sup>th</sup>**

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**Neutrino**

Chair: S. Bertolucci

09:00 F. Sanchez Nieto Long-baseline neutrino oscillations review  
 09:25 J. Cao Reactor neutrino experiments review (*remotely*)  
 09:50 A. Capone HE Nu Experimental status  
 10:15 E. Lisi Phenomenology of neutrino oscillations  
 10:40 *Coffee Break*

Chair: D. D'Angelo

11:00 A. Lamastra Models of Neutrino sources  
 11:25 S. Buson Beginning a Journey Across the Universe: The Discovery of Extragalactic Neutrino Factories  
 11:50 R. Stein A tidal disruption event coincident with a high-energy neutrino

**Astrophysics/Cosmology and GW**

12:15 E. Battistelli Status of CMB observations for the search of primordial GW  
 12:40 L. Graziani First stars in the universe

**Dark Matter & Dark Energy**

13:05 M. Vecchi Review on Dark Matter search  
 13:30 *END*  
 13:30 *Lunch*

**Dark Matter & Dark Energy**

Chair: R.D. Stein

17:00 S. Capozziello Cosmographic reconstruction to discriminate between modified gravity and dark energy  
 17:25 R. Scaramella EUCLID, Mapping the Geometry of the Dark Universe  
 17:50 D. Gilman Constraints on Dark Matter from gravitational lensing  
 18:15 M. Castellano Constraint on DM from reionization  
 18:40 V. Gammaldi Dark Matter signature in cosmic rays  
 19:05 R. Scaramella INAF Scientific program and future programs  
 19:30 *END*  
 20:30 *Social Dinner*

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**Friday, September 30<sup>th</sup>**

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**Dark Matter & Dark Energy**

Chair: A. Capone

09:00 P. Santini Constraints on Dark Energy from the abundance of massive galaxies  
 09:25 F. Saturni Measuring the Dark Matter contents of Spheroidal Galaxies

**Dark Matter**

09:50 L. Covi Theory introduction on Dark Matter models  
 10:15 E. Skorda Dark Matter searches at LHC  
 10:40 *Coffee Break*

Chair: V. Gammaldi

11:00 P. Branchini Belle II results including dark sector  
11:25 J. Jerhot Na62 results on Dark Matter searches  
11:50 P. Valente PADME results and perspectives  
12:15 C. Gatti Search for Axion Dark Matter  
12:40 P. Camarri Searches for ultra long-lived particles  
13:05 F. Kühnel Primordial BHs and Dark Matter (*remotely*)  
13:30 *END*  
13:30 *Lunch*

### Particle Physics

Chair: A. Antonelli

17:00 E. Goudzovski Search for new physics in kaon decay  
17:25 R. Quagliani Search for new physics in b decay  
17:50 M. Incagli g-2 results

### Future Prospects

Chair: A. Antonelli

18:15 E. Cavazzuti ASI future programs in astrophysics and fundamental physics  
18:40 R. Tenchini Future INFN projects in particle physics at accelerators  
19:05 *END*  
20:00 *Dinner*