Welcome to the 10th Young Researcher Meeting in Rome

18th - 21st June 2019

Welcome Letter and Final Program

On behalf of the University of Rome "Tor Vergata", the International Physicists Network and the Local Organising Committee, a warm welcome to all the participants and guests to the 10th Young Researcher Meeting.

At this edition, the itinerant yearly Young Research Meeting celebrates its tenth anniversary with a rich program organized in sessions covering six main topics: *Applied Physics*, *Astrophysics and Cosmology*, *Biophysics*, *Matter Physics*, *Particle Physics* and *Theoretical Physics*. As in its past editions, the meeting also features several special events, including a scientific visit to INFN Laboratories in Frascati (INFN-LNF) and a walking tour of the stunning ancient Rome, while the beautiful Villa Mondragone will be the setting of the lively Poster & Wine session. Novelty of the tenth edition is a Round Table Discussion on the connection between Physics and Industry, which will take place on the opening day of the meeting. The round table will gather together physicists working outside academia and representatives of the industry sector, who will be sharing their experiences.

We would like to thank all the speakers and poster presenters for the remarkable quality of their scientific works and for their enthusiasm in joining the meeting, which have made the organisational process pleasant and educational. Two invited speakers enrich the program with keynote talks on Cosmology and Matter Physics, respectively Dr Massimiliano Lattanzi (INFN-Ferrara Division) and Dr Claudio Attaccalite (Centre Interdisciplinaire de Nanoscience de Marseille).

Our recognition goes to the INFN-National Laboratories of Frascati, for the hospitality and the introduction on their main research activities delivered by Dr Paola Gianotti and Dr Antonella Balerna, and to the Physics Department of the University of Rome Tor Vergata, for having encouraged and assisted the organization of the event.

Finally, we are grateful to the sponsors that have greatly supported the organization of the conference, namely: the University of Rome "Tor Vergata" (for hosting the event and for the support through the Bando per Convegni 2019/2020), the "Tor Vergata" Division of the National Institute for Nuclear Physics, the Solar Physics Group of the University of Rome "Tor Vergata", the Piano Lauree Scientifiche, and AKKA technologies.

Rome, 6th June 2019

The Organising Committees

Permanent Organising Committee (IPN):

Fabio Agostini
Claudia Antolini
Marco Di Stefano
Marina Migliaccio
Lorenzo Pagnanini
Davide Pietrobon
Emanuela Pusceddu
Matteo Serra
Francesco Stellato

Local Organising Committee:

Lorenzo Aiello
Anna Silvia Baldi
Alessandro Buzzelli
Rocco D'Agostino
Luca Giovannelli
Elisa Nichelli
Luca Pizzimento
Giorgio Viavattene

10th Young Researcher Meeting Program

	18th June 2019 **Sala del Teatro, Villa Mondragone, Monte Porzio Catone**
09:00 -	Registration desk and poster placement
09:30 - 09:45	**Opening Remarks**
09:45 - 10:00	**Institutional Greeting** (Prof. Anna Di Ciaccio)
	SESSION 1 - Astrophysics I (Chair: Lorenzo Aiello)
10:00 - 10:20	**Stefano Carletta** *Ballistic and powered capture of asteroids in the Sun-Earth-Moon system*
10:20 - 10:40	**Andrew Miller** *Using machine learning to detect gravitational waves from young neutron stars*
10:40 - 11:00	**Sara Saracino** *High-precision astrometry with MCAO: bulge globular clusters as ideal science cases*
11:00 - 11:30	Networking coffee
11:30 - 11:50	**Martina Cardillo** *The important role of Cosmic-Ray Re-acceleration*
11:50 - 12:10	**Federico Tosone** *Cold dark matter simulations via the Lagrangian picture*
12:10 - 12:30	**Balakrishna Sandeep Haridasu** *Phenomenological study of dark energy dynamics*
12:30 - 13:30	Group Picture and Tour of Villa Mondragone
13:30 - 14:30	LUNCH
	SESSION 2 - Matter Physics I (Chair: Luca Giovannelli)
14:30 - 14:50	**Laura Fazi** *Stretchable conductors made of single wall carbon nanotubes self-grafted on polymer films*
14:50 - 15:10	**Imran Khan** *Fibered amplified Infrared laser source at 1064 nm for single pass SHG in PPLN crystal*
15:10 - 15:30	**Anna Prioriello** *Carbon nanotube/polymer composite materials for stretchable electronic devices*
15:30 - 15:50	**Alessandro D'Elia** *Synthesis of VOx nanostructured films with tunable oxidation state for application: XPS*
15:50 - 16:50	**Round Table** *Physics and Industry* Moderator: Elisa Nichelli Invited Speakers: Daniel Ricci Pacifici, Najla Said, Antonella Delle Noci
16:50 - 18:30	**POSTER & WINE**

	19th June 2019 **Aula Gismondi, University of Rome "Tor Vergata"**
08:30 - 09:30	Registration desk
	SESSION 3 - Particle Physics (Chair: Lidia Dell'Asta)
09:30 - 09:50	**Guglielmo Frattari** *A dark matter search with ATLAS at the LHC and beyond*
09:50 - 10:10	**Giuseppe Carratta** *Search for Type-III Seesaw heavy leptons with the ATLAS Detector at \sqrt{s} = 13 TeV*
10:10 - 10:30	**Roberta Pillera** *A fast muon tagger method for Imaging Air Cherenkov Telescopes*
10:30 – 10:50	**Luca De Paolis** *The VIP2 experiment: looking for the violation of the Pauli exclusion principle for electrons*
10:50 - 11:05	**Institutional Greeting** (Prof. Lucio Cerrito)
11:05 - 11:30	Networking coffee - Poster session A
	SESSION 4 - Matter Physics II (Chair: Emanuela Pusceddu)
11:30 - 11:50	**Claudia Scatigno** *Chemometrics tools for Advanced Spectroscopic Analyses*
11:50 - 12:10	**Armando Galluzzi** *Silver doping effects on irreversibility field and pinning energy of a FeSe iron based superconductor*
12:10 - 12:30	**Luca Zagaglia** *Analysis in reciprocal space of the band-pass filter effect in uniform and non-uniform grating couplers*
12:30 - 12:50	**Onofrio Mazzarisi** *Condensation of fluctuations and their dynamics in the Gaussian model*
12:50 - 13:10	**Paola Mocci** *Optical and Electronic properties of BN-ring insertions in Circumacenes: the case of Coronene and Ovalene*
13:10 - 14:10	LUNCH - Poster session A
	SESSION 5 - Astrophysics II (Chair: Giorgio Viavattene)
14:10 - 14:30	**Mariarita Murabito** *The penumbral solar filaments from photosphere to chromosphere*
14:30 - 14:50	**Elia Chiaraluce** *From radio-quiet to radio silent: radio cores in low-luminosity AGN*
14:50 - 15:10	**Alberto Iess** *Machine-Learning Classification Of Core-Collapse Supernovae Gravitational Wave Signals*
15:10 - 15:30	**Rishikesh Pandit** *Optimising Tomographic Clustering for EUCLID Photometric Survey*
15:30 - 15:50	**Margherita Fasano** *From multi-band observations to the nuclear matter equation of state*

15:50 - 16:20	Networking coffee - Poster session A
16:20 - 17:00	**Keynote talk - Massimiliano Lattanzi** *Latest news from the Cosmo: current status and challenges in cosmology*
	SESSION 6 - Biophysics I (Chair: Emiliano De Santis)
17:00 - 17:20	**Hanna Skliarova** *Cyclotron solid targets preparation for medical radionuclides production in the framework of LARAMED project*
17:20 - 17:40	**Micol De Simoni** *FRED: a fast Monte Carlo code on GPU for quality control in Particle Therapy*
17:40 - 18:40	**3° Annual IPN Meeting**
20:30	**Social Dinner**
	20th June 2019 **Aula Gismondi, University of Rome "Tor Vergata"**
08:30 - 09:30	Registration desk
	SESSION 7 - Theoretical Physics (Chair: Rocco D'Agostino)
09:30 - 09:50	**Michele Rota** *All-photonic quantum teleportation and entanglement swapping using on-demand solid-state quantum emitters*
09:50 - 10:10	**Gaetano Luciano** *Neutrino mixing and oscillations in Unruh radiation: the proton's testimony*
10:10 - 10:30	**Chiara Signorile-Signorile** *Factorisation and Local Subtraction of Infrared Divergences for QCD processes*
10:30 - 10:50	**Michele Buzzicotti** *Machine Learning and Optimal Navigation in Complex Flows*
10:50 - 11:10	**Tommaso Alberti** *The poor man's magnetohydrodynamic (PMMHD) equations: a discrete dynamical system*
11:10 - 11:40	Networking coffee - Poster session B
	SESSION 8 - Astrophysics III (Chair: Anna Silvia Baldi)
11:40 - 12:00	**Daniele Calchetti** *Tor Vergata Synoptic Solar Telescope: Preliminary Optical Design and Spectral Characterization*
12:00 - 12:20	**Eleanna Asvestari** *Reconstructing the geometry of Coronal Holes with the Potential Field Source Surface Model: towards better space weather forecasting models*
12:20 - 12:40	**Marianna Torelli** *On a new photometric Horizontal Branch morphology index*
12:40 - 13:00	**Ornella Juliana Piccinni** *A method for directed searches of continuous gravitational waves in advanced detector data*
13:00 - 13:20	**Lorenzo Mele** *QUBIC: The Q & U Bolometric Interferometer For Cosmology*

13:20 - 14:20	LUNCH - Poster session B
15:00 - 18:00	**Tour of LNF - INFN including visitor centre and DAFNE beamlines** **Seminars** **Paola Gianotti** ***Frascati National Laboratory: overview of infrastructures and activities*** **Antonella Balerna** ***The DAFNE-Light Synchrotron Radiation Facility: main features and some applications***
	21st June 2019 **Aula Gismondi, University of Rome "Tor Vergata"**
	SESSION 9 - Applied Physics (Chair: Emanuela Pusceddu)
09:30 - 09:50	**Klotilda Nikaj** *Markov-stability analysis and hierarchical structure formation in social network*
09:50 - 10:10	**Fabrizio Ambrosino** *A case study on possible radiological contamination in soils of Lo Uttaro (Caserta, Italy) landfill site*
10:10 - 10:30	**Enrico Preziosi** *TECNOMUSE: a novel, RPC-based, muon tomography scanner for the control of container terminals*
10:30 - 11:10	**Keynote talk : Claudio Attaccalite** *The story of academic publishing: from Galileo to Nature*
11:10 - 11:40	Networking coffee - Poster session B
	SESSION 10 - Biophysics II (Chair: Francesco Stellato)
11:40 - 12:00	**Aishwarya Dhar** *Aβ peptides and β-sheet breakers. A coarse grained molecular dynamics approach using GO-Martini*
12:00 - 12:20	**Emiliano De Santis** *XAS measurements of high-diluted Cu-Amylin complexes*
12:20 - 12:40	**Mariam Hassan** *Co/Pd-based synthetic antiferromagnetic multi-stacks for biomedical applications*
12:40 - 13:00	**Mihir Durve** *Learning to flock with reinforcement learning*
13:00 - 13:30	Closing Remarks and Best Poster Award
13:30 - 14:00	Take away Lunch
15:30 - 17:30	**Guided walking tour of ancient Rome**

Poster program

Global poster session (18th June, Villa Mondragone)

All the posters will be presented
(Session A + Session B)

AKKA Technologies Stand

Session A (19th June, Aula Gismondi)

Astrophysics		
1 (A1)	**Cambiè Giorgio**	*Integration and testing of the Mini-EUSO UV telescope*
2 (A2)	**Carrón Duque Javier**	*Finding Point Sources in the Cosmic Microwave Background: Needlets and Multiple Testing*
3 (A3)	**Chatzistergos Theodosios**	*Studying past solar activity with Ca II K observations*
4 (A4)	**Cifaldi Maria**	*Characterization and thermalization tests of the LSPE-SWIPE cryostat*
5 (A5)	**D'Angelo Beatrice**	*Sensitivity enhancement via vacuum squeezed injection in Advanced Virgo*
6 (A6)	**De Luca Federico**	*A study of the dynamical state of galaxy clusters by multi-wavelength synthetic maps from the 300th numerical cluster catalogue*
7 (A7)	**Di Antonio Ivan**	*Preliminary Design of the MAORY Calibration and Test Unit*
8 (A8)	**Di Marco Alessandro**	*Inflationary gravitational waves and exotic pre Big Bang Nucleosynthesis cosmology*
9 (A9)	**Foldes Raffaello**	*Solar Flares X-ray Class Distribution: Relationship with Solar Magnetic Activity*
10 (A10)	**Galuzzo Daniele**	*Proxima Centaury b: 3-d climate simulation detectability and stellar activity*
11 (A11)	**Garaventa Barbara**	*Frequency-dependent squeezing generation with EPR entanglement*

Biophysics		
12 (A12)	**Dalaqishvili Lasha**	*Drug delivery nanoparticles motion in blood*
13 (A13)	**Fischetti Marta**	*Inter-fractional monitoring in Particle Therapy treatments with 12C ions exploiting the detection of charged secondary fragments*

Matter Physics		
14 (A14)	**Abdolrahimi Maryam**	*A New Approach in Fatty Acid Capped Spinel Ferrites Synthesis and Characterization*
15 (A15)	**An Tae Kyu**	*A study on the characteristics of field-effect transistor with the length of symmetric branched side chain of thienoisoindigo-based polymers*
16 (A16)	**Banihashemi Vajihehsadat**	*Magnetic properties of zinc substituted cobalt ferrite nanoparticles*
17 (A17)	**Galdenzi Federico**	*Fe-oxidation in amphiboles: a correlated characterization of structural and transport properties*
18 (A18)	**Hadri Adil**	*Effects of Sn content on the structural and optoelectronic properties of Sn-doped ZnO thin films*
19 (A19)	**Maiellaro Alfonso**	*Topological phases in open Kitaev chains and ladders*

Particle Physics		
20 (A20)	**Green Jarred**	*Searching for Dark Matter with current and next-generation Cherenkov telescopes*
21 (A21)	**Longarini Jacopo**	*Search for Dark Photons decaying to LeptonJets with the ATLAS Experiment at the LHC*
22 (A22)	**Nozzoli Francesco**	*Perspectives of Dark Matter indirect search with Anti Deuteron Helium Detector in space.*

Theoretical Physics		
23 (A23)	**Arroub Ismail**	*Combined Forced and Natural Convection of Nanofluid in an Inclined Rectangular Cavity Ventilated by Injection or Suction*
25 (A25)	**Osmanaj Rudina**	*Gauss - Lanczos quadrature in LatticeQCD*

Session B (20th and 21st June, Aula Gismondi)

Applied Physics		
27 (B2)	**Cagnoni Jessica**	*Modelling dense snow avalanches using Cellular Automata*
28 (B3)	**Di Girolamo Flavia Viola**	*Leaf water diffusion dynamics in vivo through a sub-Terahertz portable imaging system*
29 (B4)	**Xhako Dafina**	*Medical image prediction using artificial neural networks*

Astrophysics		
30 (B5)	**Giobbi Piermarco**	*Markov-Chain-Monte-Carlo methods for statistical Bayesian estimate of cosmological parameters*
31 (B6)	**Kazakov Adrian**	*Deep Neural Networks for analysis of Mercury's planetary exosphere*
32 (B7)	**Laurenti Marco**	*Optical Variability of Active Galactic Nuclei from Catalina Sky Surveys Data*
33 (B8)	**Marcelli Nadir**	*Time dependence of the proton and helium fluxes measured by PAMELA during solar minimum (2006 - 2009)*
34 (B9)	**Pacetti Elenia**	*Statistical analysis of the CMB radiation: behind the scenes of the cosmological parameters estimation*
35 (B10)	**Paradiso Simone**	*Models for studying the reionisation history of the Universe with polarisation CMB data*
36 (B11)	**Plutino Nicola**	*Cellular automata and solar flares statistics*
37 (B12)	**Presta Giuseppe**	*The First Flight of OLIMPO Experiment: Instrument Performance*
38 (B13)	**Realini Sabrina**	*Characterization of the Optical System of the LSPE-STRIP Instrument*
39 (B14)	**Sharma Gauri**	*The KMOS Redshift One Spectroscopic Survey (KROSS): Interplay between dark matter and baryonic matter in spiral galaxies at z=1*
40 (B15)	**Stumpo Mirko**	*Causal inference by an information theoretical approach in Space Weather*
41 (B16)	**Tiberia Alessandra**	*TGFs cloud systems observed by GPM - Core Satellite*

Biophysics		
42 (B17)	**Franciosini Gaia**	*FOOT: FragmentatiOn Of Target*
43 (B18)	**Guglietta Fabio**	*From ab-initio Mesoscale Modelling of Red Blood Cells Towards Macroscale Simulations in Biomedical Devices*

Matter Physics		
44 (B19)	**Macis Salvatore**	*Thin conducting MoO3 films on copper. A new opportunity for technological applications*
45 (B20)	**Martin Henry**	*Thermodynamically Stable Site in bcc-Refractory-Interstitial Solid Solution using Ab initio*
46 (B21)	**Pelusi Francesca**	*Avalanche statistics in the coarsening dynamics of a biphasic system via lattice-Boltzmann simulations*
47 (B22)	**Postorino Sara**	*Spin Hall Effect in Two-Dimensional Monochalcogenides*
48 (B23)	**Saggese Aniello**	*The Experimental determination of NZPV on HTS tapes*
49 (B24)	**Slimani Sawssen**	*Designing Spinel Ferrite Nanoparticles by co-precipitation method*
50 (B25)	**Tirabzonlu Jeyhuna**	*Synthesis and structural and magnetic properties of Exchange coupled magnetic nanocomposites*
51 (B26)	**Zarotti Francesca**	*Surface x-ray diffraction investigation of the interface structure of Yttrium doped Barium Zirconate proton conductor grown on different substrates.*

Particle Physics		
52 (B27)	**Dimiccoli Francesco**	*Measurement of Cosmic Deuteron Flux with the AMS-02 Detector*
53 (B28)	**Sabetta Luigi**	*Fast Deep Learning on FPGAs for the Phase-II L0 Muon Barrel Trigger of the ATLAS Experiment*
54 (B29)	**Vannicola Damiano**	*Reconstruction and identification of high-pT muons in \sqrt{s} = 13 TeV proton-proton collisions with the ATLAS detector*