Europass Curriculum Vitae

Personal information

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Research experiences

Dec. 2022 - Now
PhD student at University of Campania "Luigi Vanvitelli" in collaboration with **INAF - Osservatorio Astronomico d'Abruzzo** studying the dynamical evolution and multiple-populations in Globular Clusters. Supervisors: Prof. Oscar Straniero and Prof. Lucio Gialanella.

June 2022 - Nov. 2022
Studentship at INAF - IAPS entitled "Activity of study and formation of planetary structures, through modelling and/or remote sensing and/or laboratory data" concerning the projects "ExoMars", "Dawn" and "TRIS". Study of the numerical methods of Smoothed Particle Hydrodynamics for the simulation of hydrodynamic phenomena of interest for the mentioned projects.

Feb. 2022 - June 2022
Internship at INAF - Astronomical Observatory of Rome, finalized at learning the mathematical techniques of the "Information Field Theory" and their application to astronomical data, with reference to the high-contrast images produced within the SHARK-VIS project, an instrument intended for the LBT telescope for deep detection of exoplanets through direct images.

From Dec. 2021
Research collaborator at the Physics Department - University of Rome "La Sapienza", concerning the study of multi-mass models for Globular Clusters.

Research Interests

Stellar dynamics, collisional systems, Globular Clusters, stellar systems and populations, gravothermal catastrophe, formation, evolution and stability of self gravitating systems. I am also interested in topics concerning gravity, stellar formation and evolution, dark matter, planetary sciences and numerical methods for simulations and data analysis.

Education

16th Nov. 2021
Master degree in Astronomy & Astrophysics, University of Rome "La Sapienza", *cum laude*. Thesis title: Gravothermal catastrophe in models of Globular Clusters with a mass distribution. Supervisor: Prof. Marco Merafina.

1st Oct. 2019
Bachelor's degree in Physics, University of Rome "La Sapienza".Dissertation title: Carbon ignition curves for massive stars. Supervisor: Prof. Oscar Straniero

Pubblications

2022
Merafina M. and **Teodori M.**, "Generalization of the Fokker-Planck equation for stellar orbit diffusion in multi-mass star systems" [arXiv: 2205.10209]

Collaborations

Active

– Participation to scientific meetings of the research group lead by Prof. Marco Merafina at University of Rome "La Sapienza", concerning a research project entitled "Stellar evolution and dynamical evolution in Globular Clusters: theoretic development and N-body simulations".

– Collaboration with INAF-IAPS for the study of volatiles emission from planetary surface and fractures using a Smoothed Particle Hydrodynamics (SPH) approach. Member of the International Space Science Institute (ISSI) group led by Dott. Michelangelo Formisano, for the project "Thermophysical characterization of ice-rich areas on the surface of specific planetary bodies: conditions for the formation of a transient exosphere", active in the development of SPH codes able to collaborate with Eulerian codes.

Past

– Collaboration with INAF-OAR for the development of codes for High Contrast Imaging for the SHARK-VIS project, finalized at the direct detection of extra-solar planets.

Talks

16-20 Oct. 2023	STARS Across the Universe. **M. Teodori**, O. Straniero, M. Merafina and L. Gialanella, "*Dynamical evolution of Multiple Populations in Globular Clusters*".
6-10 Feb. 2023	XVIII Congresso Nazionale di Scienze Planetarie, Perugia. **M. Teodori**, G. Magni, M. Formisano, M. C. De Sanctis and F. Altieri, "*Volatiles emission from a fracture on a planetary surface: a Smoothed-Particle-Hydrodynamics approach*".
14th Nov. 2022	G11 Workshop, Physics Department, University of Rome "La Sapienza". **M. Teodori**, "*Multi-mass collisional stellar systems models for Globular Clusters*".

Posters

8-12 May 2023	Biennial European Astrobiology Conference BEACON 2023, La Palma & Teneguia Princess Hotel on Fuencaliente, La Palma Island (Canary Islands, Spain). **M. Teodori**, G. Magni , M. Formisano , M. C. De Sanctis and F. Altieri, "*Volatiles emission from a cavity on a planetary surface using smoothed particle hydrodynamics*".

PhD schools

2-6 October 2023	INAF - Scientific Communication in Astronomy School, Bertinoro, Italy.

Seminars

Held

16th Feb. 2023	INAF-OOAb colloquia. **M. Teodori**, "*The interconnection between multi-mass dynamical models and multiple populations in Globular Clusters*".

Followed

15 June 2023, 11:30	OAPD Seminar, Good practice in science talks, Roberto Decarli (INAF-OAS Bologna).
24 May 2023, 16:00	Astroseminar, Hierarchical Black Hole Mergers: A Multi-Band Opportunity for Gravitational Waves, Giacomo Fragione (CIERA Fellow, Northwestern University, Evanston, USA).
24 May 2023, 15:00	MoRe-ASI seminar, Let's take a look inside!, prof. Luciano Iess (Dipartimento di Ingegneria meccanica e aerospaziale, Sapienza Università di Roma).
27 April 2023, 15:00	INAF-OAAb colloquia, Active volcanism on Venus: scientific implications and future perspectives through the Project "Analogs for VENus's GEologically Recent Surfaces" (AVENGERS), Piero d'Incecco (INAF-Osservatorio Astronomico d'Abruzzo).

20 April 2023, 11:30	INAF-OAPD seminar, Galactic Archaeology. From multiple stellar populations in star clusters to extremely metal-poor stars, Giacomo Cordoni (University of Padua).
18 April 2023, 14:30	INAF-IASF Milan colloquium, Scaling Relations: a new framework for understanding the evolution of early type galaxies, Prof. Cesare Chiosi (University of Padua).
06 April 2023, 14:00	MoRe-ASI seminar, Exploring the Ocean Worlds of the outer solar system: the search for life beyond Earth, Dr. Anezina Solomonidou(Hellenic Space Center - HSC).
04 April 2023, 11:30	INAF-OAPD seminar, The First Galaxies with JWST - Discoveries and Properties, Prof. Christopher Conselice (Manchester University).
16 March 2023, 15:00	Web-SEMINAR at OAAb, Globular Cluster formation as a runaway process, Prof. Alvio Renzini (INAF - Osservatorio Astronomico di Padova).
01 Feb. 2023, 11:00	IAPS Seminar - The multiplicity of stellar populations of Globular Clusters, Santi Cassisi (INAF-Osservatorio Astronomico d'Abruzzo).
17 Jan. 2023, 14:00	Astrophysics Talk - Galactic dynamics with Gaia DR3: A new resonance-like feature in the outer disc of the Milky Way, Shourya Khanna (INAF-Torino).
28 Nov. 2022, 15:00	Seminar at Department of Physics, Sapienza University of Rome - About the Observational Check of the Mechanism of Gamma Radiation in Soft Gamma Repeaters (SGR), Prof. Bisnovatyi-Kogan (Space Research Institute, IKI, Moscow).
24 Nov. 2022, 11:30	Joint Astrophysical Colloquium - First stars and their chemical fingerprints, Stefania Salvadori (Università di Firenze).
17 Nov. 2022, 11:00	OATo Seminars - Gravity vs matter: stars as laboratory to test theories of gravity, Dr. Aneta Magdalena Wojnar (Laboratory of Theoretical Physics, Department of Theoretical Physics, Institute of Physics, University of Tartu
16 Nov. 2022, 14:30	Joint Astrophysics Colloquium - Multiple populations in Globular Clusters in the era of JWST, Prof. Antonino Milone (University of Padua).
15 Nov. 2022, 14:00	Astrophysics Talk - Galactic archaeology using chemical clocks, Giada Casali (DIFA - Unibo).
21 Oct. 2022, 10:00	Soft skills - La leadership nei contesti professionali, Career Service Sapienza & Porta Futuro Lazio.
20 Oct. 2022, 16:00	Astroseminar - Dark matter, black holes and gravitational waves, Gianfranco Bertone (GRAPPA, Amsterdam).
18 Oct. 2022, 14:00	Astrophysics Talk - On the rotation curve of disk galaxies in General Relativity, Luca Ciotti (Università di Bologna).
14 Oct. 2022, 11:00	IFPU Colloquium - Dark Matter in the Universe, Katherin Freese (University of Texas at Austin).
14 Sept. 2022, 11:00	IAPS we seminar - Volcanism on Mercury, D. Rothery (The Open University, Milton Keyenes, UK).
7 Sept. 2022, 14:30	Joint Astrophysics Colloquium - Comets as clues to the formation and evolution of planetesimals, Prof. Jurgen Blum (Technische Universität Braunschweig, German).
15 June 22, 15:30	JEDI Star Talk - The astrochemical trail from clouds to disks and planets, Ewine F. van Dishoeck (Leiden Observatory, Leiden University).
15 June 22, 14:30	Deciphering ALMA observations of protoplanetary disks Deciphering ALMA observations of protoplanetary disks, Prof. Cornelis P. Dullemond (Zentrum fürAstronomie – University of Heidelberg.)
27 April 22, 15:00-18:00	Spazio, Ultima Frontiera II Edizione - II Giornata, Sapienza Università di Roma.
13 April 22, 18:00	Masterclass	Excel, le basi: stili, gestione e organizzazione del foglio di lavoro
08 April 22, 16:00-17:00	Il tempo tra scienza e filosofia, Discovery Link Sapienza.
29 March 22, 10:00-12:00	Exploring the challenges, opportunities and the future of Space Education in Europe	European Space Policy Institute (ESPI)
08 Sept. 21, 14:00-15:00	Employabiliy Lab: Il ruolo dell'employability e delle risorse personali per la ricerca proattiva del lavoro	Sapienza Università di Roma.
23-28 April 21 e 4-7/05/21	Corso di Finanza Personale	Link Economics Sapienza Università di Roma
3 Oct. 2019, 16:00-18:00	Fisica degli Esopianeti: Progetti futuri, pianeti abitabili e biosignatures (Lezione 15)	Cattedra "Enrico Fermi" 2018/2019, Prof.ssa Giovanna Tinetti

Training courses

27 Jan. 2022	**Machine Learning with MATLAB**, MathWorks | Training Services.
17 Jan. 2022	**MATLAB Programming Techniques**, MathWorks | Training Services.
15 Dec. 2021	**MATLAB for Data Processing and Visualization**, MathWorks | Training Services.
11 Dec. 2021	**Deep Learning Onramp**, MathWorks | Training Services.
09 Dec. 2021	**Machine Learning Onramp**, MathWorks | Training Services.
03 Dec. 2021	**MATLAB Fundamentals**, MathWorks | Training Services.
24 Nov. 2021	**MATLAB Onramp**, MathWorks | Training Services.
04 May 2021	**National course of online formation, Cyber Security - basic level**, INFN.
06 May 2014	**European Computer Driving Licence ECDL**.

Coding/software experience

Programming languages	**C** intermediate level (4 yrs, Bachelor's degree thesis and courses, PhD project), **Fortran** intermediate level (2 yrs, Master thesis, PhD project), **MATLAB** (for programming) basic level (PhD course) and **Python** intermediate level (2 yrs, INAF experiences and PhD project).
Professional skills	Basic experience (1 yr) with parallel codes: **PySPH** for hydrodynamical simulations, **MCLUSTER** and **NBODY6++** for setting initial conditions and perform N-body simulations of Globular Clusters respectively.
Data analysis and visualization	Experience with **MATLAB** (6 yrs) and **Python** (2 yrs) acquired during university courses, thesis work, INAF experiences and PhD project.
Document drafting	Experience of 6 yrs with LaTeX, in particular for scientific reports and papers drafting.
Remote control	Basic knowledge (2 yrs) of remote connection to servers for running numerical simulation using SSH and SFTP protocol or a remote desktop software like AnyDesk, Splashtop and TeamViewer.
Others	Intermediate experience in **Office automation** packages, in particular with software for presentation, document elaboration and spreadsheets, refined from Italian secondary school to today (around 12 yrs experience). Basic ability in managing videoconferencing.

Teaching experiences

Tutoring	Occasional and sometimes regular tutoring of high school students in Math and Physics.
Others	Helping out with master degree thesis work of prof. Merafina students.