MONTHLY NEWSLETTER

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REFEREED PUBLICATIONS

G. Casali, **L. Magrini**, A. Frasca, A. Bragaglia, G. Catanzaro, V. D'Orazi, R. Sordo, E. Carretta, L. Origlia, G. Andreuzzi, X. Fu, A. Vallenari
Stellar Population Astrophysics (SPA) with TNG. The old open clusters Collinder 350, Gulliver 51, NGC 7044, and Ruprecht 171
Astronomy & Astrophysics, (2020), 643, A12
https://www.aanda.org/articles/aa/abs/2020/11/aa39176-20/aa39176-20.html

V. Gelli, S. Salvadori, A. Pallottini, A. Ferrara
The stellar populations of high-redshift dwarf galaxies
Monthly Notices of the Royal Astronomical Society (2020), 498, 3
https://academic.oup.com/mnras/article-abstract/498/3/4134/5900533?redirectedFrom=fulltext

L. K. Hunt, C. Tortora, M. Ginolfi, R. Schneider
Scaling relations and baryonic cycling in local star-forming galaxies: II. Gas content and star-formation efficiency
Astronomy & Astrophysics, in press
https://ui.adsabs.harvard.edu/abs/2020arXiv201002919H/abstract

C. Mininni, M. T. Beltrán, V. M. Rivilla, A. Sánchez-Monge, **F. Fontani**, T. Möller, **R. Cesaroni**, P. Schilke, S. Viti, I. Jiménez-Serra, **L. Colzi, A. Lorenzani,** L. Testi
The GUAPOS project: G31.41+0.31 Unbiased ALMA sPectral Observational Survey - I. Isomers of C2H4O2
Astronomy & Astrophysics, in press
https://arxiv.org/abs/2009.13297

J. Soldateschi, N. Bucciantini, L. Del Zanna
Magnetic deformation of neutron stars in scalar-tensor theories
Astronomy & Astrophysics, in press
http://arxiv.org/abs/2010.14833

A. A. Christou, G. Borisov, **A. Dell'Oro**, A. Cellino, M. Devogèle
Composition and origin of L5 Trojan asteroids of Mars: Insights from spectroscopy
Icarus (2021), 354, 113994
https://www.sciencedirect.com/science/article/pii/S0019103520303602?via%3Dihub

M. Baes, A. Nersesian, V. Casasola, **S. Bianchi**, L. P. Cassarà, C. J. R. Clark, I. De Looze, W. Dobbels, J. Fritz, M. Galametz, F. Galliano, S. C. Madden, A. V. Mosenkov, S. Viaene, A. Trčka, E. M. Xilouris
Nonparametric galaxy morphology from UV to submm wavelengths
Astronomy & Astrophysics (2020), 641, A119
https://www.aanda.org/articles/aa/abs/2020/09/aa38470-20/aa38470-20.html

A. Nersesian, S. Viaene, I. De Looze, M. Baes, E. M. Xilouris, M. W. L. Smith, **S. Bianchi**, V. Casasola, L. P. Cassarà, C. J. R. Clark, W. Dobbels, J. Fritz, F. Galliano, S. C. Madden, A. V. Mosenkov, A. Trčka
High-resolution, 3D radiative transfer modelling. V. A detailed model of the M 51 interacting pair
Astronomy & Astrophysics (2020), 643, A90
https://www.aanda.org/component/article?access=doi&doi=10.1051/0004-6361/202038939

A. Longobardi, A. Boselli, M. Fossati, J. Villa, **S. Bianchi**, V. Casasola, E. Sarpa, F. Combes, G. Hensler, D. Burgarella, C. Schimd, A. Nanni, P. Côté, V. Buat, P. Amram, L. Ferrarese, J. Braine, G. Trinchieri, S. Boissier, et al.
A Virgo Environmental Survey Tracing Ionised Gas Emission (VESTIGE). VII. Bridging the cluster-ICM-galaxy evolution at small scale
Astronomy & Astrophysics, in press
https://www.aanda.org/component/article?access=doi&doi=10.1051/0004-6361/202039020

T. Barnes, J. C. Tan, **F. Fontani**, B. Wu
SiO emission as a probe of Cloud-Cloud Collisions in Infrared Dark Clouds
Monthly Notices of the Royal Astronomical Society, in press
https://arxiv.org/abs/2009.13890

N. van der Marel, T. Birnstiel, **A. Garufi**, E. Ragusa, V. Christiaens, D. Price, S. Sallum, D. Muley, L. Francis, R. Dong
On the diversity of asymmetries in gapped protoplanetary disks
Astronomical Journal, in press
https://ui.adsabs.harvard.edu/abs/2020arXiv201010568V/abstract

Maiolino, R.; Cirasuolo, M.; Afonso, J.; Bauer, F.E.; Bowler, R.; Cucciati, O.; Daddi, E.; De Lucia, G.; Evans, C.; Flores, H.; Gargiulo, A.; Garilli, B.; Jablonka, P.; Jarvis, M.; Kneib, J.-P.; Lilly, S.; Looser, T.; Magliocchetti, M.; Man, Z.; **Mannucci, F.**; Maurogordato, S.; McLure, R.J.; Norberg, P.; Oesch, P.; **Oliva, E.**; Paltani, S.; Pappalardo, C.; Peng, Y.; Pentericci, L.; Pozzetti, L.; Renzini, A.; Rodrigues, M.; Royer, F.; Serjeant, S.; Vanzi, L.; Wild, V.; Zamorani, G.
MOONRISE: The Main MOONS GTO Extragalactic Survey
ESO Messenger (2020), 180, 24
https://www.eso.org/sci/publications/messenger/archive/no.180-jun20/messenger-no180-24-29.pdf

MAGIC Collaboration: V. A. Acciari, S. Ansoldi, [...]
External authors: S. Celli, **G. Morlino**
Study of the GeV to TeV morphology of the γ-Cygni SNR (G78.2+2.1) with MAGIC and Fermi-LAT
Astronomy & Astrophysics, in press
https://ui.adsabs.harvard.edu/abs/2020arXiv201015854M/abstract

Cirasuolo, M.; Fairley, A.; Rees, P.; Gonzalez, O.A.; Taylor, W.; Maiolino, R.; Afonso, J.; Evans, C.; Flores, H.; Lilly, S.; **Oliva, E.,** Paltani, S.; Vanzi, L.; Abreu, M.; Accardo, M.; Adams, N.; Álvarez Méndez, D.; Amans, J.-P.; Amarantidis, S.; Atek, H.; Atkinson, D.; Banerji, M.; Barrett, J.; Barrientos, F.; Bauer, F.; Beard, S.; Béchet, C.; Belfiore, A.; Bellazzini, M.; Benoist, C.; Best, P.; Biazzo, K.; Black, M.; Boettger, D.; Bonifacio, P.; Bowler, R.; Bragaglia, A.; Brierley, S.; Brinchmann, J.; Brinkmann, M.; Buat, V.; Buitrago, F.; Burgarella, D.; Burningham, B.; Buscher, D.; Cabral, A.; Caffau, E.; Cardoso, L.; Carnall, A.; Carollo, M.; Castillo, R.; Castignani, G.; Catelan, M.; Cicone, C.; Cimatti, A.; Cioni, M.-R.L.; Clementini, G.; Cochrane, W.; Coelho, J.; Colling, M.; Contini, T.; Contreras, R.; Conzelmann, R.; **Cresci, G.**; Cropper, M.; Cucciati, O.; Cullen, F.; Cumani, C.; Curti, M.; Da Silva, A.; Daddi, E.; Dalessandro, E.; Dalessio, F.; Dauvin, L.; Davidson, G.; de Laverny, P.; Delplancke-Ströbele, F.; De Lucia, G.; Del Vecchio, C.; Dessauges-Zavadsky, M.; Di Matteo, P.; Dole, H.; Drass, H.; Dunlop, J.; Dünner, R.; Eales, S.; Ellis, R.; Enriques, B.; Fasola, G.; Ferguson, A.; Ferruzzi, D.; Fisher, M.; Flores, M.; Fontana, A.; Forchi, V.; Francois, P.; Franzetti, P.; Gargiulo, A.; Garilli, B.; Gaudemard, J.; Gieles, M.; Gilmore, G.; Ginolfi, M.; Gomes, J.M.; Guinouard, I.; Gutierrez, P.; Haigron, R.; Hammer, F.; Hammersley, P.; Haniff, C.; Harrison, C.; Haywood, M.; Hill, V.; Hubin, N.; Humphrey, A.; Ibata, R.; Infante, L.; Ives, D.; Ivison, R.; Iwert, O.; Jablonka, P.; Jakob, G.; Jarvis, M.; King, D.; Kneib, J.-P.; Laporte, P.; Lawrence, A.; Lee, D.; Li Causi, G.; Lorenzoni, S.; Lucatello, S.; Luco, Y.; Macleod, A.; Magliocchetti, M.; **Magrini, L.**; Mainieri, V.; Maire, C.; **Mannucci, F.**; Martin, N.; Matute, I.; Maurogordato, S.; McGee, S.; Mcleod, D.; McLure, R.; McMahon, R.; Melse, B.-T.; Messias, H.; Mucciarelli, A.; Nisini, B.; Nix, J.; Norberg, P.; Oesch, P.; Oliveira, A.; Origlia, L.; Padilla, N.; Palsa, R.; **Pancino, E.**; Papaderos, P.; Pappalardo, C.; Parry, I.; Pasquini, L.; Peacock, J.; Pedichini, F.; Pello, R.; Peng, Y.; Pentericci, L.; Pfuhl, O.; Piazzesi, R.; Popovic, D.; Pozzetti, L.; Puech, M.; Puzia, T.; Raichoor, A.; **Randich, S.**; Recio-Blanco, A.; Reis, S.; Reix, F.; Renzini, A.; Rodrigues, M.; Rojas, F.; Rojas-Arriagada, Á.; Rota, S.; Royer, F.; **Sacco, G.**; Sanchez-Janssen, R.; **Sanna, N.;** Santos, P.; Sarzi, M.; Schaerer, D.; Schiavon, R.; Schnell, R.; Schultheis, M.; Scodeggio, M.; Serjeant, S.; Shen, T.-C.; Simmonds, C.; Smoker, J.; Sobral, D.; Sordet, M.; Spérone, D.; Strachan, J.; Sun, X.; Swinbank, M.; Tait, G.; Tereno, I.; Tojeiro, R.; Torres, M.; Tosi, M.; **Tozzi, A.**; Tresiter, E.; Valenti, E.; Valenzuela Navarro, Á.; Vanzella, E.; Vergani, S.; Verhamme, A.; Vernet, J.; Vignali, C.; Vinther, J.; Von Dran, L.; Waring, C.; Watson, S.; Wild, V.; Willesme, B.; Woodward, B.; Wuyts, S.; Yang, Y.; Zamorani, G.; Zoccali, M.; Bluck, A.; Trussler, J.

MOONS: The New Multi-Object Spectrograph for the VLT

ESO Messenger (2020), 180, 10

https://www.eso.org/sci/publications/messenger/archive/no.180-jun20/messenger-no180-10-17.pdf

D. N. Della Giustina, H. H. Kaplan, A. A. Simon, W. F. Bottke, C. Avdellidou, M. Delbo, R.-L. Ballouz, D. R. Golish, K. J. Walsh, M. Popescu, H. Campins, M. A. Barucci, **G. Poggiali**, R. T. Daly, L. Le Corre, V. E. Hamilton, N. Porter, E. R. Jawin, T. J. McCoy, H. C. Connolly Jr, J. L. Rizos Garcia, E. Tatsumi, J. de Leon, J. Licandro, S. Fornasier, M. G. Daly, M. M. Al Asad, L. Philpott, J. Seabrook, O. S. Barnouin, B. E. Clark, M. C. Nolan, E. S. Howell, R. P. Binzel, B. Rizk, D. C. Reuter e D. S. Lauretta

Exogenic basalt on asteroid (101955) Bennu

Nature Astronomy, in press

https://www.nature.com/articles/s41550-020-1195-z#Bib1

Media INAF: https://www.media.inaf.it/2020/09/21/tracce-di-vesta-su-bennu/

O.A. Gonzalez, A. Mucciarelli, L. Origlia, M. Schultheis, E. Caffau, P. Di Matteo, **S. Randich,** A. Recio-Blanco, M. Zoccali, P. Bonifacio, E. Dalessandro, R.P. Schiavon, **E. Pancino,** W. Taylor, E. Valenti, Á. Rojas-Arriagada, **G. Sacco,** K. Biazzo, M. Bellazzini, M.-R.L. Cioni, G. Clementini, R. Contreras Ramos, P. de Laverny, C. Evans, M. Haywood, V. Hill, R. Ibata, S. Lucatello, **L. Magrini,** N. Martin, B. Nisini, **N. Sanna,** M. Cirasuolo, R. Maiolino, J. Afonso, S. Lilly, H. Flores, **E. Oliva,** S. Paltani, L. Vanzi

MOONS Surveys of the Milky Way and its Satellites

ESO Messenger (2020), 180, 18

https://www.eso.org/sci/publications/messenger/archive/no.180-jun20/messenger-no180-18-23.pdf

I. Jiménez-Serra, J. Martín-Pintado, **V. M. Rivilla**, L. Rodríguez-Almeida, E. R. Alonso Alonso, S. Zeng, E. J. Cocinero, S. Martín, M. Requena-Torres, R. Martín-Domenech, **L. Testi**
Toward the RNA-World in the Interstellar Medium—Detection of Urea and Search of 2-Amino-oxazole and Simple Sugars
Astrobiology (2020), 20, 9
https://ui.adsabs.harvard.edu/abs/2020AsBio..20.1048J/abstract

E. Antonucci, **M. Romoli**, V. Andretta, S. Fineschi, P. Heinzel, J. D. Moses, G. Naletto, G. Nicolini, D. Spadaro, L. Teriaca, A. Berlicki, G. Capobianco, G Crescenzio, V. Da Deppo, **M. Focardi** et al.
Metis: the Solar Orbiter visible light and ultraviolet coronal imager
Astronomy & Astrophysics (2020), 642, A10
https://www.aanda.org/articles/aa/abs/2020/10/aa35338-19/aa35338-19.html

E. Amato, **N. Bucciantini, B. Olmi**
XI Congresso Nazionale Oggetti Compatti – CNOC XI
Il Colle Di Galileo (2020), 9, 2
https://oajournals.fupress.net/index.php/cdg/article/view/12063

A. Garufi
Planet-forming gas seen with new eyes
Il Colle Di Galileo (2020), 9, 2
https://oajournals.fupress.net/index.php/cdg/article/view/12064

S. Randich, S. Bianchi
INAF Arcetri Astrophysical Observatory at 150
Il Colle Di Galileo (2020), 9, 2
https://oajournals.fupress.net/index.php/cdg/article/view/12061

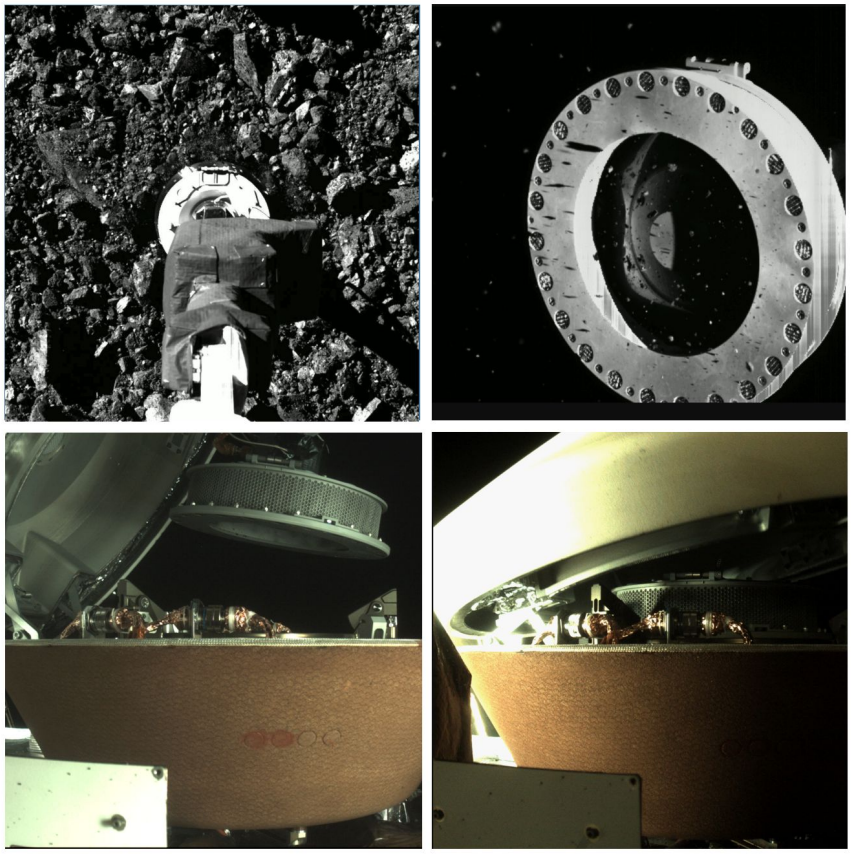
TECHNOLOGICAL MILESTONES

OSIRIS-REx sample collection and storage

NASA OSIRIS-REx mission successfully achieved the first part of its primary objective collecting a sample from the surface of the primitive asteroid 101955 Bennu.
On the night of 20th October 2020 the spacecraft performed a challenging maneuver called Touch And Go (TAG) approaching the asteroid using an innovative system of Natural Features Tracking.
After visual evaluation of the amount of material collected, the science team decided to stow the sample to mitigate a leak in the collection mechanism (probably due to a larger rock blocking the flaps of the collection chamber).
On October 29th the head of the collection arm (where the sample is hosted) was detached and sealed in the capsule that will return on Earth in 2023.
Now the spacecraft is moving to a safe distance from the asteroid and the team mission is preparing the departure from Bennu in March 2021.

INAF-Arcetri is involved in the OSIRIS-REx mission with **John Robert Brucato** and **Giovanni Poggiali** as members of the Science Team. Together with the rest of the scientists involved in the mission, they participated in the sample site selection campaign to locate the site where the sample was collected.

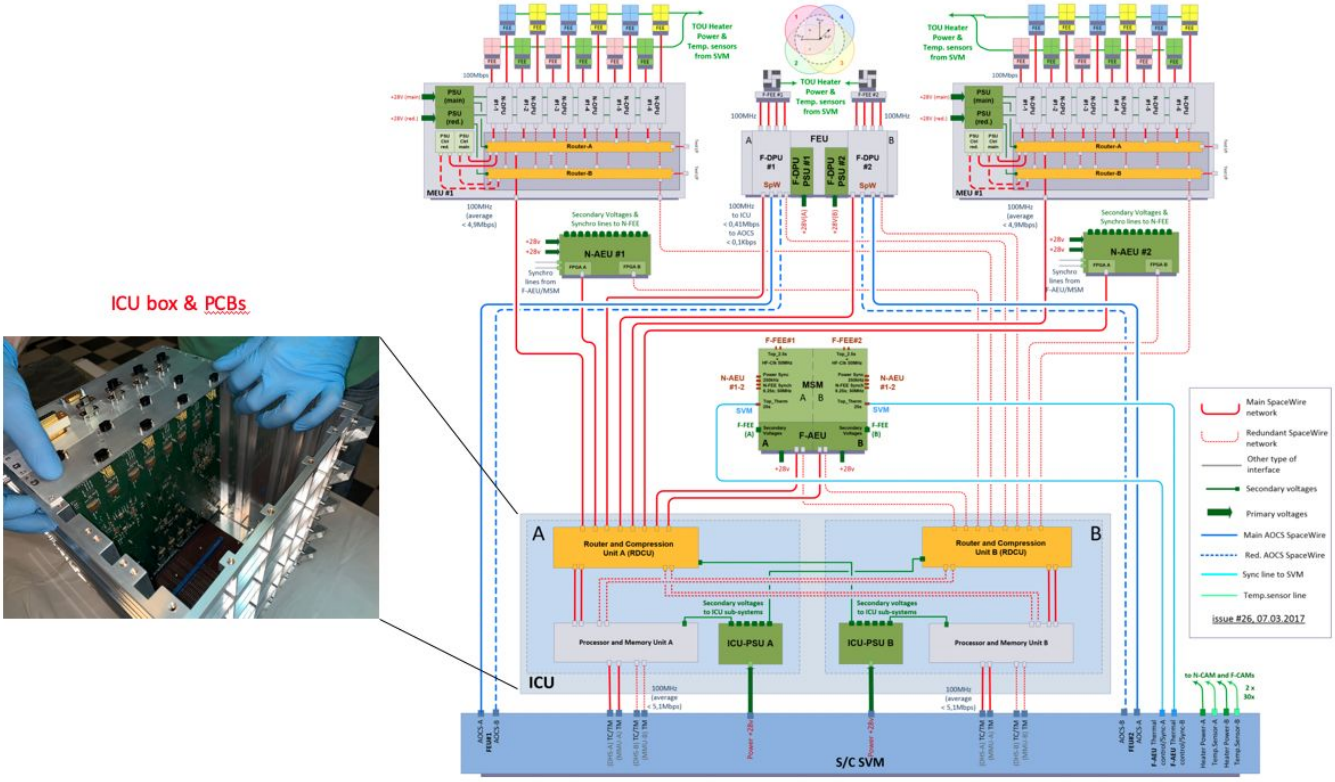
OSIRIS-REx website: https://www.asteroidmission.org
Media INAF:
https://www.media.inaf.it/2020/10/21/osiris-rex-tag/?fbclid=IwAR2WxGI15KjpcXngTwuPzvp4opnlOEH5ZAveeYK6H5R7IjW3gamACodi-rw



Credits: NASA/OSIRIS-REx

PLATO - Instrument Control Unit (ICU) EM1 delivery to PLATO Mission Consortium/DLR

On October 15th, the first engineering model (EM1) of the PLATO ICU has been delivered to PMC/DLR in Berlin, to be integrated within the PLATO Data Processing System (DPS). This is a fundamental milestone, as it establishes the beginning of the AIV/AIT activities at DPS level and the capability to forward to the Spacecraft simulator the Science and housekeeping telemetries provided by the PLATO emulated cameras, thanks to the SW developed in Rome by INAF/IAPS.
The ICU is the main computer on-board the PLATO Payload and the only electrical interface towards the Service Module (platform) OBC and MMU (on-board computer and mass-memory unit, refer to the annexed picture). Most of the PLATO ICU HW and part of the on-board SW and FW have been developed by Kayser Italia in Livorno (http://www.kayser.it) with a contribution from the IWF Institute in Graz (Austria), while the Unit's Application SW is incrementally developed up to the Flight Model by INAF/IAPS in Rome and the University of Wien.
PLATO is the third Medium-class Mission of the ESA's Cosmic Vision Programme, aimed at the discovery and characterisation of exoplanets and exoplanetary systems exploiting the transits method, down to Earth-like twins orbiting stars similar to our own Sun. Italy, with ASI and INAF, plays a fundamental technological role as it is responsible for the provision to the PLATO Mission Consortium (PMC) of the ICU along with the telescopes, and is providing the PLATO targets input catalog and the contribution to the coordination of the overall Consortium, thanks to the Mission CoPi-ship.
INAF - Arcetri Astrophysical Observatory is involved with **Mauro Focardi** as ICU System Engineer.
PLATO ESA website: https://sci.esa.int/web/plato



Credits: DLR, Berlin

NEW ARRIVALS

STAFF RESEARCHERS AND TECHNOLOGISTS

Francesco Belfiore

I am a new staff researcher in the Extragalactic Group. I am particularly interested in chemical evolution, the physics of the ionised interstellar medium and the star formation histories of galaxies. My expertise lies mainly in optical (integral field) spectroscopy and in sub-mm radio astronomy. I am honored to be a new member of the research community in Arcetri, where I will be working to shed new light into the chemical evolution history of the Universe.

Carolina Belli

I'm a mathematical engineer, I graduated at the University of Florence in 2009. I started working in Arcetri in spring 2014 and from July of this year I have a permanent contract. I'm working with the Radio astronomy Group in Arcetri, maily for the SKA project. The main aspects I'm involved in, are the System Engineering part of SKA-LFAA and the projecting of the VHDL code for the signal processing chain for the low frequency part of the SKA telescope.

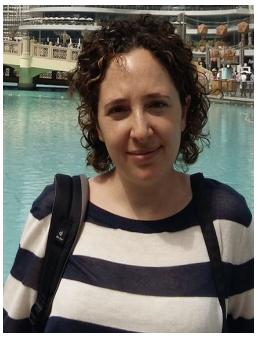
Simone Chiarucci

I am a researcher at the Arcetri Astronomical Observatory in Florence. I obtained my PhD with a dissertation on calibration techniques and digital signal processing in radio astronomy. Since 2017, I am involved in the research activity concerning the functional modelling of the LFAA for the SKA-Low telescope, providing all the MATLAB work for the LFAA signal model which has supported the Signal Processing System Detailed Design Document. In the last year, I have been working in the low-bridging phase activities for the System CDR.

Paola Di Ninni

Ph.D. in Experimental Physics - Earth Remote Sensing science from satellite - at the University of Siena in 2017. I started working three years ago as a grant researcher in Radio Astronomy at INAF-OAA where I currently work as a technologist. My research activity is mainly focused on experimental and numerical electromagnetic characterization of LOFAR and SKA1-Low radio telescopes. From 2009 to 2013, I worked in materials characterization for biomedical and industrial applications at the Department of Physics and Astronomy, University of Florence.

Anna Marino

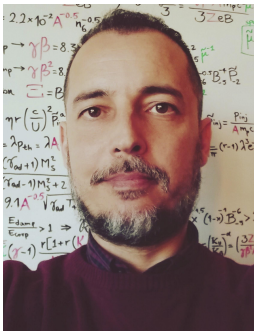


I received my PhD in Astronomy in 2010 from the University of Padova, under a joint program with the Universidad Catolica de Chile, later I worked at the Max Planck Institute for Astrophysics in Garching and at the Australian National University. In 2015 I was awarded a "Discovery Early Career Researcher Award" from the Australian Research Council, and in 2018 a "MSCA European Fellowship" for a project focused on the newly discovered generations of stars in globular clusters. I have been recognized by the international community in the field of stellar spectroscopy and star clusters research for novel and fundamental contribution to the studies on stellar populations in globular clusters.

Giovanni Morlino

I graduated from university of Roma, "La Sapienza" and I received my Ph.D. in Astrophysics at the university of Pisa in 2008, with a dissertation on shock acceleration of particles in astrophysical environments. My research interests lie in the field of high energy Astrophysics and focus mainly on the origin and propagation of cosmic rays and their interaction with the Galactic environment. I also join national and international collaborations for the construction of next generation Cherenkov telescopes (ASTRI and CTA) that will investigate the most violent phenomena in the Universe through the detection of gamma-rays

Marco Padovani



My research activity is aimed at the formulation of theoretical models related to Galactic star-forming regions. I am interested in understanding their physical and chemical evolution, from the scale of molecular clouds to that of protostar-disc systems, focusing in particular on the role of cosmic rays.
I obtained my PhD at the University of Florence and INAF-Osservatorio Astrofisico di Arcetri. Before closing the loop and getting a staff position at INAF, I worked as a postdoc in several European institutes (Madrid, Barcelona, Paris, and Montpellier).

Lorenzo Pino

I have obtained a PhD in Astronomy in 2018, jointly released by Università di Padova and Université de Genève. Spending time in two observatories gave me access to a vast expertise on exoplanets, both theoretical and observational: still today I pursue my research connecting state-of-the-art observational techniques and theories. I then moved to Anton Pannekoek Institute for Astronomy in Amsterdam for a postdoc. There, I learned the importance of working in a diverse and inclusive environment, e.g.supervising a student in the context of ASPIRE. I am looking forward to keep pursuing these goals in Arcetri Observatory, starting from November the 4th!

Alessio Turchi

I'm a theoretical physicist with a knack for computing. I have a PhD in Nonlinear Dynamics and Theoretical Physics.
My scientific works encompass statistical mechanics, chaos and turbulence.
My current research focus is numerical simulations of atmospheric physics in order to characterize and forecast optical turbulence. I developed the atmospheric forecast system software (ALTA) used by the LBT telescope.

POSTDOCTORAL FELLOWS

Gianluca Marotta

Ph.D. in Industrial Engineering at the University of Florence, in his thesis he developed two methods for the reconstruction of the profile of a new prototype of solar collector. For about 4 years he worked on the field of the Concentrating Solar Energy, with a particular attention on the measurement of the optical quality of Parabolic Trough Collectors.
Now he works at INAF-OAA as Software Engineer on the Square Kilometer Array Project.

BRIGHT-NIGHT

INAF Arcetri Astrophysical Observatory takes part in the 2020 edition of the European Researchers' Night (www.bright-night.it) in collaboration with the consortium of Tuscan universities and research institutions. The event has been conceived by the European Commission with the aim of spreading scientific culture.
The events proposed by INAF-OAA will take place on **Friday November 27th online**.

Anche quest'anno l'INAF Osservatorio Astrofisico di Arcetri partecipa alla Notte Europea delle Ricercatrici e dei Ricercatori (www.bright-night.it), in collaborazione con il consorzio di atenei e enti di ricerca toscani.
La manifestazione è ideata dalla Commissione Europea con l'obiettivo di diffondere la cultura scientifica.
Gli eventi proposti da INAF-OAA si terranno **venerdì 27 novembre online**.

Info BRIGHT-NIGHT INAF-OAA:
https://www.arcetri.inaf.it/component/content/article/184-divulgazione/2522-bright-night-27-novembre-2020
www.bright-night.it/enti-di-ricerca/inaf-oaa

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