MONTHLY NEWSLETTER

INAF Osservatorio Astrofisico di Arcetri

ISSUE 4, DEC. 2020

REFEREED PUBLICATIONS

C. Codella, L. Podio, A. Garufi, J. Perrero, P. Ugliengo, **D. Fedele**, C. Favre, E. Bianchi, C. Ceccarelli, S. Mercimek, **F. Bacciotti**, K.L.J. Rygl, **L. Testi**
ALMA chemical survey of disk-outflow sources in Taurus (ALMA-DOT). IV. Thioformaldehyde (H2CS) in protoplanetary disks: spatial distributions and binding energies
Astronomy & Astrophysics, in press
https://arxiv.org/abs/2011.02305

T. Fornaro, J. R. Brucato, G. Poggiali, M. A. Corazzi, M. Biczysko, M. Jaber, D. I. Foustoukos, R. M. Hazen, A. Steele
UV Irradiation and Near Infrared Characterization of Laboratory Mars Soil Analog Samples
Frontiers in Astronomy and Space Sciences, November 2020
https://www.frontiersin.org/articles/10.3389/fspas.2020.539289/full

L. Podio , A. Garufi , C. Codella, D. Fedele, K. Rygl, C. Favre, **F. Bacciotti**, E. Bianchi, C. Ceccarelli, S. Mercimek, R. Teague, **L. Testi**
ALMA chemical survey of disk-outflow sources in Taurus (ALMA-DOT) III. The interplay between gas and dust in the protoplanetary disk of DG Tau
Astronomy & Astrophysics, in press
https://arxiv.org/pdf/2011.01081.pdf

E. Bianchi, C. J. Chandler, C. Ceccarelli, **C. Codella**, N. Sakai, A. López-Sepulcre, L. T. Maud, G. Moellenbrock, B. Svoboda, Y. Watanabe, T. Sakai, F. Ménard, Y. Aikawa, F. Alves, N. Balucani, M. Bouvier, P. Caselli, E. Caux, S. Charnley, S. Choudhury, M. De Simone, F. Dulieu, A. Durán, L. Evans, C. Favre, **D. Fedele**, S. Feng, **F. Fontani**, L. Francis, T. Hama, T. Hanawa, E. Herbst, T. Hirota, M. Imai, A. Isella, I. Jiménez-Serra, D. Johnstone, C. Kahane, B. Lefloch, L. Loinard, M. J. Maureira, **S. Mercimek**, A. Miotello, S. Mori, R. Nakatani, H. Nomura, Y. Oba, S. Ohashi, Y. Okoda, J. Ospina-Zamudio, Y. Oya, J. Pineda, **L. Podio**, A. Rimola, D. Segura Cox, Y. Shirley, V. Taquet, **L. Testi**, C. Vastel, S. Viti, N. Watanabe, A. Witzel, C. Xue, Y. Zhang, B. Zhao, S. Yamamoto
FAUST I. The hot corino at the heart of the prototypical Class I protostar L1551 IRS5
Monthly Notices of the Royal Astronomical Society (2020), 498, 1
https://academic.oup.com/mnrasl/article/498/1/L87/5874261

C. Gil-Lozano, A. G. Fairén, V. Muñoz-Iglesias, M. Fernández-Sampedro, O. Prieto-Ballesteros, L. Gago-Duport, E. Losa-Adams, D. Carrizo, J. L. Bishop, **T. Fornaro**, E. Mateo-Martí

Constraining the preservation of organic compounds in Mars analog nontronites after exposure to acid and alkaline fluids

Nature (2020), Scientific Reports, 10, 15097

https://www.nature.com/articles/s41598-020-71657-9

TECHNOLOGICAL MILESTONES

Ariel: implementation phase

On Nov. 12th, ESA's exoplanet mission *Ariel*, scheduled for launch in 2029, has moved from study to implementation phase, following which an industrial contractor will be selected to build the spacecraft. The mission's payload module, which includes a one metre-class cryogenic telescope and associated science instruments, is provided by the Ariel Mission Consortium. The consortium comprises more than 50 institutes from 17 European countries. NASA also contributes to the payload. After an intensive period working on the preliminary design concepts and on the consolidation of the required technologies to demonstrate the mission feasibility, the consortium is ready to move *Ariel* forward to the implementation stage and the optimal spacecraft design for answering fundamental questions about our place in the cosmos:

- What are the physical processes shaping planetary atmospheres?
- What are exoplanets made of?
- How do planets and planetary systems form and evolve?

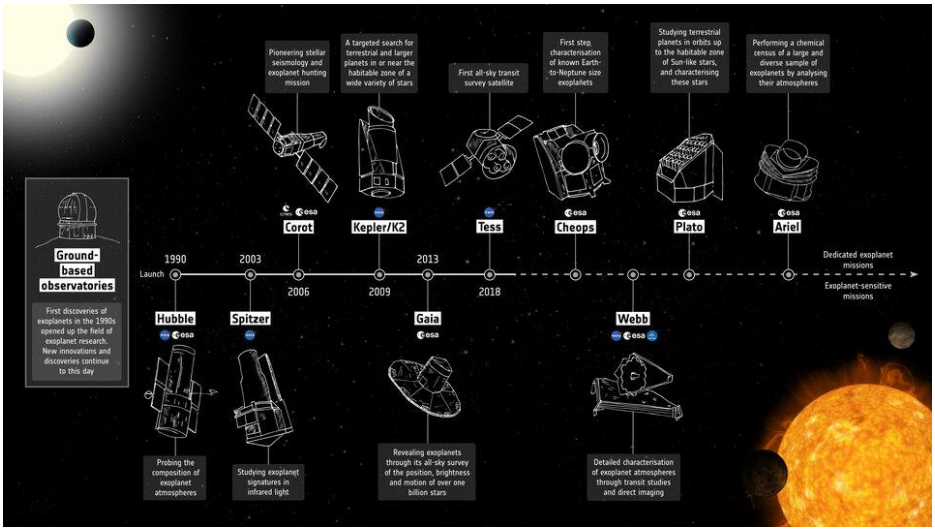
In the coming months, industry will be asked to make bids to supply spacecraft hardware for Ariel. Around summer next year, the prime industrial contractor will be selected to build it. Along with the Spacecraft Prime Contractor, ASI will select the Italian Industries for the telescope and on-board electronics manufacturing, thanks to the support of the Italian Consortium of Scientific Institutes, to which our Observatory belongs. In particular Arcetri, will lead the Payload and Instrument Control Unit (ICU) design and manufacturing with a contribution to the electronics driving the Satellite's Fine Guidance Sensor (FGS).

INAF-OAA *Ariel* team:

Technology: A. Brucalassi, D. Ferruzzi, N. Sanna, M. Xompero, V. Noce, R. Nesti, P. Bolli, A. Lorenzani, C. Del Vecchio, G. Falcini, V. Biliotti, L. Carbonaro as well as M. Focardi and A. Tozzi that are the local coordinators of the ICU unit and Telescope Assembly respectively.

Science: A. Brucalassi, G. Casali, C. Codella, D. Fedele, M. Focardi, A. Garufi, L. Magrini, L. Podio, M. Rainer, G. Sacco, N. Sanna, M. Tsantaki, M. Van der Swaelmen.

https://www.esa.int/Science_Exploration/Space_Science/Ariel_moves_from_blueprint_to_reality



Credits: ESA

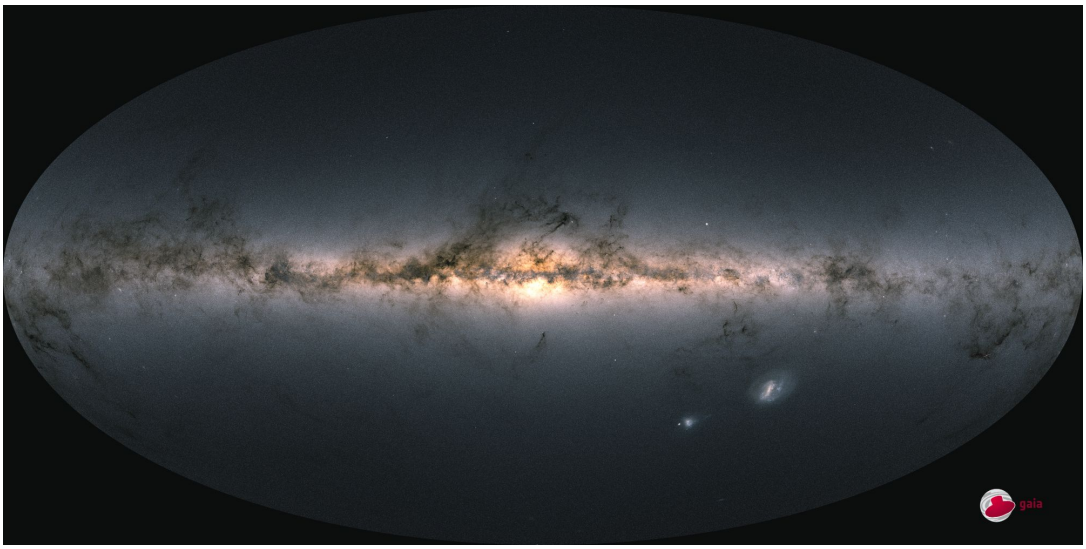
Early 3rd *Gaia* data release

On 3rd of December, the **early third *Gaia* data release EDR3** has been made public.

Gaia is the ESA astrometric mission, launched in 2013, currently scanning the sky to obtain the most complete census of the Milky Way. Previous *Gaia* releases have already revolutionized our knowledge of the Milky Way, its stellar content, and its immediate surroundings, with thousands of *Gaia*-based research results published since the first release, in 2016. EDR3 will contain astrometry and photometry based on three years of observations and it will increase both the number of stars (two billions) and the quality of the measurements. EDR3 will also contain a first assessment of stellar crowding.

The Italian community is one of the main contributors to the *Gaia* DPAC (Data Processing and Analysis Consortium), working on almost every aspect of the mission preparation and data analysis, from astrometry and photometry to time-variability; from fundamental physics to data validation.

The *Gaia* group at the INAF Arcetri Astrophysical Observatory hosts one member of the *Gaia* Science Team (**S. Randich**), and two *Gaia* DPAC teams: one responsible for preparing the spectrophotometric standard stars for the flux calibration of *Gaia* data (**E. Pancino, N. Sanna, M. Rainer**), and one responsible for the software for astrometric CCD processing (centroids, raw fluxes and angular sizes determination) of the signals of Solar System bodies (**A. Dell'Oro**).



Credits: ESA/Gaia

Website: https://www.cosmos.esa.int/web/gaia/early-data-release-3
RAI Tg Toscana: Arcetri, missione Gaia nello spazio
Media INAF: Tutti i colori delle stelle di Gaia: dai dati al diagramma H-R

New data release (DR4.0) from the Gaia-ESO Large Public Spectroscopic Survey

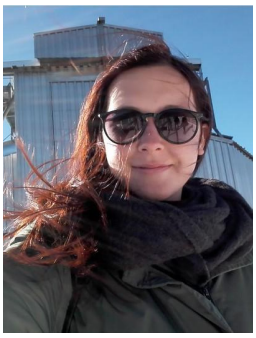
On Dec. 10th, the new data release from the Gaia-ESO Large Public Spectroscopic Survey (GES) DR4.0 has been completed, delivering almost 200,000 spectra in the ESO archive.

The **Gaia-ESO core team at INAF-OAA** includes S. Randich (Gaia-ESO Co-PI), E. Franciosini, L. Magrini, L. Morbidelli, E. Pancino, G. Sacco, M. Van der Swaelmen;
G. Casali, A. Brucalassi, M. Padovani, N. Sanna are also part of the Consortium.
http://archive.eso.org/cms/eso-archive-news/New-data-release-DR4-from-the-Gaia-ESO-Spectroscopic-Public-Survey.html

NEW ARRIVALS

PhD students - cycle XXXVI

Matilde Signorini



I graduated in Oct. 2020 at the University of Florence, with a Master Thesis on improving the use of Quasars as standard candles, which is also the topic of my PhD project supervised by Guido Risaliti (UNIFI). I'm interested in widening our understanding of Quasars emission mechanisms, in implementing them as a tool to investigate the expansion history of the Universe and, more in general, in observational cosmology. I'm currently involved in UV and X-rays spectroscopic analysis of Quasars and in improving and diversifying our ways to use them as a cosmological probe.

Giulia Tozzi

I work in the Extragalactic Group of INAF-OAA supervised by Giovanni Cresci (INAF-OAA) and Alessandro Marconi (UNIFI). I am mainly interested in the study of galaxy evolution processes with an observational approach. My PhD project is focused on feedback mechanisms and outflows driven by active galactic nuclei, topics I started studying in the framework of my Master Thesis (UNIFI). In particular, I use Integral Field Spectroscopy to investigate the physical properties of these outflows and their impact on the host galaxy evolution, aiming at establishing their role in quenching the star formation activity within the host galaxy.

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