

François Mernier, Ph.D.

Astronome-adjoint (Assistant-astronomer)

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Persons of reference:

- Dr. Didier Barret (IRAP, France) – [didier.barret@irap.omp.eu](mailto:didier.barret@irap.omp.eu)
- Dr. Matteo Guainazzi (ESA/ESTEC, The Netherlands) – [Matteo.Guainazzi@sciops.esa.int](mailto:Matteo.Guainazzi@sciops.esa.int)
- Prof. Jelle S. Kaastra (SRON, The Netherlands) – [J.S.Kaastra@sron.nl](mailto:J.S.Kaastra@sron.nl)

Born: June 27, 1989 – Brussels, Belgium

Nationalities: Belgian, French

## Current position

- *Astronome-adjoint CNAP (Assistant-astronomer)*

IRAP (OMP), CNRS, Université de Toulouse (Toulouse, France)

## Past positions

2022-2024	<i>XRISM Support Scientist</i> , NASA GSFC (Sponsor: Dr. Brian Williams) (Noordwijk, The Netherlands)
2019-2022	<i>ESA Research Fellow</i> , ESTEC (Sponsor: Dr. Matteo Guainazzi) (Noordwijk, The Netherlands)
2017-2019	<i>Postdoctoral Researcher</i> , MTA-Eötvös University (Sponsor: Dr. Norbert Werner) (Budapest, Hungary)
2017-2017	<i>Postdoctoral Researcher</i> , Leiden University (Sponsor: Prof. Jelle S. Kaastra) (Leiden, The Netherlands)

## Skills

### AREAS OF SPECIALIZATION

High-energy astrophysics – X-ray spectroscopy – Clusters/groups of galaxies –  
Intracuster medium – Chemical enrichment – *XMM-Newton*

### COMPUTING SKILLS

Expert	SPEX • <i>XMM-Newton</i> SAS • <i>XRISM</i> data analysis software
Good	UNIX console – BASH – fortran 90 – Python (incl. numpy, scipy, astropy, matplotlib) – L <sup>A</sup> T <sub>E</sub> X – XSPEC – HEAsoft – SAO ds9 – <i>Chandra</i> CIAO – Linux – Mac OS
Intermed.	Inkscape – GIMP – C – Windows
Basic	HTML – C++ – IDL – IRAF

### LANGUAGES

Fluent	French – English
Intermed.	Dutch

## Education

2013-2017	PHD in High-energy Astrophysics, Leiden University/SRON (Leiden/Utrecht, The Netherlands)
2010-2012	MSC in Space Sciences, University of Liège (Liège, Belgium) – <i>Magna Cum Laude</i>
2007-2010	BSC in Physics, Université Libre de Bruxelles (Brussels, Belgium) – <i>Cum Laude</i>
2001-2007	HIGH SCHOOL in Latin-Mathematics, Lycée Émile Jacqmain (Brussels, Belgium) – <i>Cum Laude</i>

## Grants & Awards

2024	<i>XRISM</i> observation (PI) - “The chemical composition of the cool-core cluster Abell 2199”, AO1, 220 ks (~61 h), \$192,019
2024	<i>XRISM</i> observation (PI) - “Deciphering the dynamics and chemical enrichment of the triple-merging system Abell 85”, AO1, 350 ks (~97 h), \$172,369
2023	NASA Astrophysics Data Analysis Program (ADAP) - “Exploring the cosmic evolution of the chemical composition of galaxy clusters”, \$237,000
2023	<i>Chandra</i> archive (PI) - “Metals under the microscope: Revisiting the enrichment in the core of the Perseus cluster”, Cycle 25, \$47,000
2022	<i>XMM-Newton</i> observation (PI) - “A deep exploration of chemical enrichment and thermodynamics of S0 galaxies”, AO20, 81 ks (~31 h), \$49,000
2019	<i>XMM-Newton</i> observation (PI) - “Searching for X-ray non-thermal emission in an extraordinarily radio-bright galaxy group”, AO19, 210 ks (~58 h)
2016	71th Netherlands Astronomy Conference - Poster Prize: Laureate

## Scientific responsibilities & Collaborations

- 2025-now Co-chair of the *NewAthena Topical Panel SWG1* (*NewAthena* Science Study team)
- 2025-now Member of the X-IFU Consortium
- 2025-now Member of the X-IFU Science Advisory Team (X-SAT)
- 2025-now Member of the X-IFU Calibration Team (X-CaT)
- 2022-2024 Support Scientist for the *XRISM* Guest Observer Facility
- 2022-2024 Chair of the LEM (Line Emission Mapper) intergalactic medium abundances sub-group
- 2021-2024 Co-chair of the *Athena* Topical Panel SWG1.2 (*Athena* Science Study team)
- 2015-2018 CHEERS collaboration (PI: J. de Plaa)
- Reviewed 9 publications as anonymous referee.
- Invited in 6 time allocation committees of X-ray observatories.
  
- Ongoing projects / collaborations: E. Pointecouteau, D. Barret, N. Clerc, S. Dupourqué (France) – A. Simionescu, J. de Plaa, J. S. Kaastra, L. Gu, M. Guainazzi, M. Wise (Netherlands) – N. Werner, R. Grossová (Czech Republic) – F. Gastaldello, C. Pinto, S. Ettori, M. Gaspari, V. Biffi, E. Rasia (Italy) – Y. Ichinohe, K. Sato, K. Nomoto, J.-P. Breuer (Japan) – A. Ogorzalek, N. Truong, J. ZuHone, E. Hodges-Kluck, Y. Su, A. Tümer (USA) – M.-L. Gendron-Marsolais (Spain) – A. Richard-Laferrrière, A. E. Sansom (UK)

## Conferences, Colloquia & Workshops

### INVITED TALKS

- June 2025 “Dynamics and enrichment of the intracluster medium: From Resolve to X-IFU”, *20th X-IFU Consortium meeting*, Toulouse (France)
- Sept. 2024 “Physics of Galaxy Clusters and Groups”, *First Results from the SRG/eROSITA All-Sky Survey: From Stars to Cosmology*, Garching (Germany)
- Jul. 2024 “The metallicity of the ICM: observations”, *EAS Annual Meeting 2024*, Padova (Italy)
- Jul. 2024 “Metallicity and chemical abundance measurements and in galaxy groups in the era of high-resolution X-ray spectroscopy”, *Galaxy groups in the era of eROSITA and Euclid*, Sesto (Italy)
- Dec. 2021 “Measuring metal abundances in galaxy groups: challenges and prospects”, *Japan-Netherlands joint workshop: high-resolution X-ray spectroscopy of cosmic plasmas*, online
- Dec. 2020 “Chemical enrichment in galaxy clusters”, *Extragalactic universe with HE and VHE sources*, online
- June 2019 “Chemical abundances in the hot atmospheres of galaxy clusters, groups, and elliptical galaxies”, *Astrophysics of Hot Plasmas in Extended X-ray Sources*, ESAC, Madrid (Spain)
- March 2018 “Spatial distribution of metals in the intracluster medium”, *SnowCluster 2018: The Physics of Galaxy Clusters*, Snowbird, Utah (USA)
- Nov. 2017 “Elemental abundances and chemical enrichment in the intracluster medium”, *Clusters of Galaxies: Physics and Cosmology – International Space Science Institute (Workshop)*, Bern (Switzerland)

## CONTRIBUTED TALKS

- Jan. 2024 “Discovery of X-ray inverse-Compton emission and estimate of the volume-averaged magnetic field in a galaxy group”, *243rd AAS meeting*, New-Orleans, LA (USA)
- Aug. 2023 “Robust detection of diffuse X-ray inverse-Compton emission in a galaxy group”, *High-resolution X-ray spectroscopy – A Chandra workshop*, online
- June 2023 “Robust discovery of diffuse inverse-Compton emission in a galaxy group”, *The X-ray Universe 2023*, Athens (Greece)
- Feb. 2023 “Intracluster Medium Abundance Mapping with LEM”, *Science with the Line Emission Mapper: From Planets to Galaxies and Beyond*, Boston (USA)
- Nov. 2022 “The chemical universe: Enrichment in galaxy clusters unveiled by Athena”, *Exploring the Hot and Energetic Universe: The 3rd scientific conference dedicated to the Athena X-ray observatory*, online
- Sept. 2022 “An X-ray view of chemical enrichment in galaxy groups and clusters”, *Charting the metallicity evolution history of the Universe*, Catania (Italy)
- July 2022 “The cycle of metals in the infalling elliptical galaxy NGC 1404”, *The Physical Properties of the Groups of Galaxies*, Bertinoro (Italy)
- Feb. 2022 “Abundances in cluster outskirts with LEM”, *LEM Science Workshop*, online
- Jan. 2022 “Measuring metal abundance in the hot gas of galaxy groups and elliptical galaxies”, *50 years astronomical X-ray spectroscopy*, online
- Nov. 2021 “The cycle of metals in the elliptical galaxy NGC1404”, *14th ESA SCI-S Workshop (SSW)*, Aranjuez (Spain)
- Oct. 2020 “Metals (and dust) in the hot gas phase: From massive clusters down to massive galaxies”, *The Rise of Metals and Dust through Cosmic Times*, online
- July 2019 “Chemical abundances and enrichment in the intracluster medium”, *Tracing Cosmic Evolution with Clusters of Galaxies*, Sexten (Italy)
- March 2019 “Chemical enrichment of the atmospheric gas in clusters, groups, and massive galaxies”, *Physics of the Intra-Cluster Medium: Theory and Computation*, Budapest (Hungary)
- June 2017 “Radial distribution of metals in the hot intra-cluster medium as observed by XMM-Newton”, *The X-ray Universe 2017*, Rome (Italy)
- April 2017 “Radial metal abundance profiles in the intra-cluster medium of cool-core clusters, groups, and ellipticals”, *Physics of the Intra-Cluster Medium*, Beijing (China)
- May 2016 “CHEERS! The origin of heavy elements in galaxy clusters”, *SRON Science Days*, Delfsen (The Netherlands)
- July 2015 “The CHEERS project”, *The Metal Enrichment of Diffuse Gas in the Universe*, Sexten (Italy)
- May 2015 “CHEERS: Chemical enrichment in the hot gas of galaxy clusters seen through XMM-Newton EPIC”, *Spectroscopy of Cosmic Plasma in the Era of ASTRO-H*, Tokyo (Japan)
- June 2014 “An XMM-Newton view of Abell 4059”, *The X-ray Universe 2014*, Dublin (Ireland)

## COLLOQUIA & SEMINARS

- March 2025 “Chemical enrichment: From stars to the intracluster medium”, IRAP seminar, Toulouse (France)
- Jan. 2025 “The assembly, dynamics, and chemistry of galaxy clusters seen by XRISM”, NASA SED director’s seminar, online
- Apr. 2024 “Chemical enrichment: from stars and galaxies to large-scale structures”, MIT Astrophysics Colloquium, MIT, Cambridge, MA (USA)

- Feb. 2023 “Chemical enrichment in the large-scale Universe”, X-ray Lab Journal Club, NASA/GSFC, Greenbelt, MD (USA)
- March 2022 “Constraining the origin and models of chemical enrichment in galaxy clusters using the Athena X-IFU”, Athena Science Conversation, ASST meeting, online
- Feb. 2022 “Unveiling the chemical history of galaxy clusters and the Universe”, Athena X-ray Advances: ASST and ACO Science Webinar, online
- Oct. 2021 “The link between supernovae, supermassive black holes, and the large-scale Universe”, *GRAD Talks (Yildiz Technical University)*, [online](#)
- March 2021 “How to understand stars and supernovae by looking at... galaxy clusters”, *ESTEC breakfast seminar*, online
- Feb. 2021 “From stars to large-scale structures: chemical enrichment in the intracluster medium”, *Video-Seminar (Observatoire de Strasbourg)*, online
- Jan. 2021 “From stars to large-scale structures: chemical enrichment in the intracluster medium”, *IPAG seminar (Université Grenoble-Alpes)*, online
- Jan. 2021 “From stars to large-scale structures: chemical enrichment in the intracluster medium”, *GECO Café Club (Laboratoire d’Astrophysique de Marseille)*, online
- Sept 2020 “Dragonfly 44 (...and the dark matter content of ultra-diffuse galaxies)”, *ESTEC breakfast seminar*, online
- April 2020 “Discovery of a giant fossil cavity in the Ophiuchus galaxy cluster”, *ESTEC breakfast seminar*, online
- March 2020 “Does gravity really exist? Clues from galaxy clusters”, *ESTEC breakfast seminar*, Noordwijk (The Netherlands)
- Jan. 2020 “From supernovae to galaxies (and beyond): What metals in hot galactic and cluster atmospheres tell us”, *Kavli IPMU Colloquium*, Tokyo (Japan)
- Jan. 2020 “From supernovae to galaxies (and beyond): What metals in hot galactic and cluster atmospheres tell us”, *Hiroshima University Seminar*, Hiroshima (Japan)
- Jan. 2019 “Elemental abundances and chemical enrichment in the hot intracluster medium”, *MPE seminar*, Garching (Germany)
- Dec. 2018 “Metals in galaxy clusters and groups, and giant elliptical galaxies hot atmospheres: Recent improvements and current challenges of X-ray observations”, *CfA lunch talk*, Cambridge (USA)
- May 2018 “Elemental abundances and chemical enrichment in the hot intracluster medium”, *Hiroshima University Seminar*, Hiroshima (Japan)
- May 2018 “Understanding the chemical enrichment pattern in the hot haloes of massive ellipticals, groups, and clusters of galaxies”, *Kavli IPMU Colloquium*, Tokyo (Japan)
- March 2018 “From supernovae to galaxy clusters: Chemical enrichment in the hot intracluster medium”, *Lowell Observatory Colloquium*, Flagstaff, Arizona (USA)
- Feb. 2018 “Elemental abundances and chemical enrichment in the intracluster medium”, *IRAP Seminar*, Toulouse (France)
- April 2017 “From supernovae to galaxy clusters: Observing the chemical enrichment in the intra-cluster medium”, *PhD Colloquium*, Leiden (The Netherlands)
- Jan. 2017 “From supernovae to galaxy clusters: Chemical enrichment of the intra-cluster medium seen by *XMM-Newton*”, *Ortvaay Colloquium*, Budapest (Hungary)
- Dec. 2013 “Probing chemical abundances in Abell 4059 using *XMM-Newton*”, *Argelander Institut für Astronomie Seminar*, Bonn (Germany)

#### POSTERS

- April 2024 “Measuring metal abundances in galaxy clusters and groups in the era of high-resolution X-ray spectroscopy”, *21st Meeting of the High Energy Astrophysics Division (HEAD)*

- of the American Astronomical Society, Waikoloa Village (Hawaii)
- March 2023 “Detection of diffuse inverse-Compton X-ray emission in a galaxy group”, *20th Meeting of the High Energy Astrophysics Division (HEAD) of the American Astronomical Society*, Waikoloa Village (Hawaii)
- March 2023 “Intracluster Medium Abundance Mapping with LEM”, *20th Meeting of the High Energy Astrophysics Division of the American Astronomical Society*, Waikoloa Village (Hawaii)
- June 2021 “Clusters, groups, and isolated galaxies: similar or different chemical enrichment histories?”, *EAS 2021 (European Astronomical Society Annual Meeting)*, Leiden (online)
- June 2021 “The cycle of metals in the elliptical galaxy NGC 1404”, *Galaxy Cluster Formation II (GCF 2021)*, ESO (online)
- Sept. 2019 “Metals in the intracluster medium”, *X-ray astronomy 2019: Current Challenges and New Frontiers in the Next Decade*, Bologna (Italy)
- Sept. 2018 “Abundance measurements in the intracluster medium: Consequences of spectral code improvements”, *Exploring the Hot and Energetic Universe: The second scientific conference dedicated to the Athena X-ray observatory*, Palermo (Italy)
- Sept. 2017 “Radial distribution of metals in the intra-cluster medium”, *The power of X-ray spectroscopy*, Warsaw (Poland)
- Dec. 2016 “Radial metal abundance profiles in the hot intra-group and intra-cluster medium”, *The Physics of Groups and Galaxy Properties therein*, Paris (France)
- May 2016 “Chemical enrichment in the hot intra-cluster medium seen with XMM-Newton/EPIC”, *XMM-Newton: The next decade*, ESAC, Madrid (Spain)
- May 2016 “The origin of heavy elements in galaxy clusters”, *71th Netherlands Astronomy Conference*, Nunspeet (The Netherlands)
- May 2015 “An XMM-Newton study of temperatures and abundances in Abell 4059”, *70th Netherlands Astronomy Conference*, Nunspeet (The Netherlands)
- Sept. 2013 “Chemical enrichment in clusters of galaxies from the XMM/Suzaku to the ASTRO-H era”, *4th ASTRO-H summer school*, Shuzenji (Japan)

## Teaching & Outreach

### TEACHING IN CLASSES

- 2025 Nuclear instrumentation (practical course), MSc level, Université de Toulouse
- 2025 Introduction to Python and Linux (practical course), BSc level, Université de Toulouse
- 2025 Experimental physics (practical course), BSc level, Université de Toulouse
- 2014-2015 High energy astrophysics (theoretical course), MSc level, Leiden Observatory

### STUDENT TUTORING & SUPERVISION

- 2025 Supervising MSc student (Margot Courtoux): MSc thesis, IRAP
- 2024-now Supervising postbac student (Rachel Hemmer): ADAP award project, GSFC
- 2023-2024 Mentoring three post-bacs students at NASA GSFC (career advice, tips in writing applications, etc.)
- 2022 Co-supervising MSc student (Teodora-Elena Bulichi): [LEAPS summer programme](#), ESTEC
- 2021 Supervising MSc students (Teresa Matamoro, Amanda Byström): [LEAPS summer programme](#), ESTEC

2021	Co-supervising MSc student (Dimitris Chatzigiannakis): MSc thesis, Leiden Observatory
2020	Supervising BSc student (Tora Arnesen): <a href="#">LEAPS summer programme</a> , ESTEC
2020	Co-supervising BSc student (Iga Kaczmarek): ESA internship, ESTEC
2018-2019	Co-supervising BSc student (Anna Görgei): BSc thesis, Eötvös University
2017-2018	Co-supervising BSc student (Ádám Boldog): BSc thesis, Eötvös University
Sum. 2015	Co-supervising BSc student (Sinancan Kara): BSc thesis, SRON/Bogazici University
2011-2013	Private student tutoring (mathematics, physics), high school level, Brussels

#### MISCELLANEOUS

2024	Seminar: “Making a winning proposal”, CRESST II Proposal Seminar, online
2022-2024	Co-lead of the LEM comms working group (managing <a href="#">twitter</a> and <a href="#">facebook</a> LEM accounts)
June 2022	“Chemical enrichment in the large-scale Universe”, LEAPS seminar, Leiden (The Netherlands)
June 2022	“The Hot Universe”, co-presented with N. Clerc, Athena Summer School, Toulouse (France)
2019	“Astronomy on Tap - Budapest” (co-organiser), wide audience
2018	High energy astrophysics (guest lecturer), MSc level, Eötvös University
2007-now	Astronomy camp (teaching & animating, high school level), “ <a href="#">Jeunesse et Science ASBL</a> ”, Modave (Belgium)

#### OUTREACH TALKS

Sept. 2021	“The link between supernovae, supermassive black holes, and the large-scale Universe”, <i>Astronomy on Tap - Leiden</i> , Leiden (The Netherlands)
Aug. 2020	“Black holes” (in French), <i>Jeunesse et Science</i> , Modave (Belgium)
Dec. 2019	“Space telescopes” (in French), <i>Jeunesse et Science</i> , Modave (Belgium)
July 2019	“Clusters of galaxies... and the surprises of their spectacular hot atmospheres”, <i>Astronomy on Tap - Budapest</i> , Budapest (Hungary)
April 2019	“The dark side of matter”, <i>Astronomy on Tap - Budapest</i> , Budapest (Hungary)
Dec. 2018	“Pluto (and the borders of the Solar System)” (in French), <i>Jeunesse et Science</i> , Modave (Belgium)
Dec. 2017	“Stellar nucleosynthesis” (in French), <i>Jeunesse et Science</i> , Modave (Belgium)
Jan. 2017	“A journey to the stars” (in French), <i>Heydeken rest home</i> , Brussels (Belgium)
April 2016	“Clusters of galaxies” (in French), <i>Jeunesse et Science</i> , Modave (Belgium)
Aug. 2014	“Clusters of galaxies” (in French), <i>Jeunesse et Science</i> , Modave (Belgium)
April 2013	“Massive stars” (in French), <i>Jeunesse et Science</i> , Modave (Belgium)
Aug. 2012	“The Sun across time” (in French), <i>Jeunesse et Science</i> , Modave (Belgium)
Aug. 2011	“Dark matter” (in French), <i>Jeunesse et Science</i> , Modave (Belgium)
Aug. 2010	“Death of stars” (in French), <i>Jeunesse et Science</i> , Modave (Belgium)
April 2008	“Black holes” (in French), <i>Jeunesse et Science</i> , Modave (Belgium)



## Department responsibilities & Initiatives

Jan 2026	SOC member of the “ <a href="#">Lumière (Latest Upgraded Methodologies for the Investigation of X-Ray sources)</a> ” workshop, Paris (France)
Jan 2024	LOC member of the “ <a href="#">2nd XRISM Community Workshop</a> ”, College Park, MD (USA)
Jan 2023	LOC member of the “ <a href="#">1st XRISM Data Analysis Workshop</a> ”, College Park, MD (USA)
2020-2022	Member of the ESTEC SAC (Staff Association Committee), ESTEC
2020-2022	Member/coordinator of the YPAG (Young Professional Advisory Group), ESTEC
2020-2022	Organiser of weekly “ <a href="#">breakfast seminars</a> ”, ESTEC
Jan. 2021	Organiser of a mini-workshop on galaxy clusters (~15 participants from Dutch institutes), ESTEC
2019	Webmaster of the <a href="#">Lendület Hot Universe Research Group</a> website, Budapest (Hungary)
March 2019	LOC member of the “ <a href="#">Physics of the Intra-Cluster Medium: Theory and Computation</a> ” conference, Budapest (Hungary)
2014-2017	Chair/organiser of regular “Galaxy clusters meetings”, Leiden Observatory
2014-2015	Organiser of the colloquium dinner events, SRON
2014-2017	Member of the “Social committee”, Leiden Observatory
2013-2014	Online update of arXiv preprints, Leiden Observatory website

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