



Francis Fortin
CNES Postdoc Fellow



X-ray binaries ; Gamma-ray bursts ; Near-infrared ; Population of compact objects ; Multi-messenger

Research Positions

2023 - 2024	Institut de Recherche en Astrophysique et Planétologie (IRAP/GAHEC), Toulouse CNES Postdoc Fellow, SVOM/CAGIRE, ELT/MOSAIC, population of compact objects in X-ray binaries.
2020 - 2023	Laboratoire Astroparticules et Cosmologie (APC/AHE), Paris LabEx UnivEarthS Fellow, evolution of neutron-star X-ray binaries.
2019 - 2020	Laboratoire Astroparticules et Cosmologie (APC/Gravitation), Paris ATER, LISA, progenitors of double compact binaries.
2016 - 2019	Astrophysique, Instrumentation et Modélisation, (AIM), CEA-Saclay PhD, formation, evolution and environment of X-ray binaries.
2016	Astrophysique, Instrumentation et Modélisation, (AIM), CEA-Saclay Internship, identification of high-energy sources.
2015	Leibniz Institut für Astrophysik, Postdam Internship, optical variability of cataclysmic variables.
2014	Institut de Physique Nucléaire, Orsay Internship, calibration of a magnetic spectrometer.

Academic Curriculum

2019	Doctorate degree in Astronomy & Astrophysics , Université de Paris
2016	Masters degree in Astronomy & Astrophysics , Université Paris-Saclay, Observatoire de Paris.
2014	Bachelor degree in Fundamental Physics , Université Paris-Saclay.
2013	Prep. Class for Engineering Schools (CPGE) , Lycée Henry Bergson, Angers
2011	Baccalauréat , Lycée St Agnès, Angers

Teaching Duties

2020	University Staff trainer , Université Paris Cité (20 hr) Training permanent staff to the use of Paris Diderot Observatory.
2020	Experimental Physics , Université Paris Cité (126 hr, L3) Astronomical observations, data reduction & analysis.
2019	PACES , Université de Paris (52 hr, L1) General Physics curriculum for Health students.
2018	CPEI , Université Paris Diderot (28 hr, L1) Labs and personal courses for engineering curriculum at the university.

Roles in International Collaborations

2024 -	SVOM Burst Advocate Validation & reports of GRB observations.
2023 -	Colibri/CAGIRE , SVOM ground segment Commissioning & Data analysis pipeline for a nIR imaging camera.
2023 -	MOSAIC Science Team , ELT Building science cases for MOSAIC for transient & multi-messenger astrophysics.
2021 -	ENGRAVE , ESO Writing & Operations team for LVK O4. VLT/FORS2 and X-Shooter imaging/spectroscopy.

Thesis supervision

2020 - 2023 **Julien Marchioro**, co-supervisor & invited member of the jury.
"The gravitational Universe: searching for the progenitors of gravitational waves." (20%)

Supervision of Students

2024 **TBD**
"Characteristics of neutron stars in X-ray binaries found within the eROSITA survey." (90%)

2023 **Anish Kalsi (BSc)**
"A catalogue of Low-Mass X-ray Binaries in the Galaxy." (100%)

2023 **Raphaëlle Pinardon (MSc)**
"A study of VLT/X-Shooter spectra of X-ray binaries." (50%)

2022 **Coline Dubos (MSc)**
"Broadband spectroscopy and modeling of a Be X-ray binary." (50%)

2021 **Tristan Bouchet (MSc)**
"Studies of high-mass X-ray binaries with VLT/X-Shooter" (50%)

2017 **Warren Massonneau (BSc)**
"Evolution of X-ray binaries in the HR diagram" (20%)

Involvement in the Community

2024 **Referee for A-rank journals**
A&A, ApJ, MNRAS, MNRAS Letters

IRAP Laboratory Council
Post-doc representative

Colibri Science Meetings
Organizer

2023 **HMXBwebcat and LMXBwebcat administrator**
Maintaining and updating the participative X-ray binary databases on GitHub.

2022 **Examiner**
NSERC Discovery Grants Program

2021 **IdEx Université de Paris**
Post-doc representative for the LabEx UnivEarthS to defend the University's application.

Press releases, Outreach & Consulting

2023 **"Le catalogue des étoiles binaires massives de notre galaxie "**
LabEx UnivEarthS press release.

2022 **"Latest news from the Cosmos"**
Podcast on the french radio station Aligre FM.

"À l'origine des systèmes binaires d'étoiles, une histoire de couple"
CNRS and LabEx UnivEarthS press releases.

2020 **"The Book of Stars"**
Scientific consulting for Ubisoft during the developement of a space-opera videogame.

2017 **Palais de la Découverte, Paris.**
45' presentations to the general public during weekends.



Number of 1st authored papers in A-rank journals: 6
h-index : 6

Publications in A-rank journals

2023

- [10] “**A catalogue of high-mass X-ray binaries in the Galaxy: from the INTEGRAL to the Gaia era**”
F. Fortin, F. García, A. Simaz Bunzel, and S. Chaty. *A&A* 671, A149 (Mar. 2023).
- [9] “**Impact of tides on non-coplanar orbits of progenitors of high-mass X-ray binaries**”
A. Simaz Bunzel, F. García, J. A. Combi, **F. Fortin**, and S. Chaty. *A&A* 670, A45 (Feb. 2023).
- [8] “**Interaction of a high-mass X-ray binary with the interstellar medium through stellar wind.**”
J. Marchioro, S. Chaty, A. Coleiro, **F. Fortin**, and A. Simaz Bunzel. *A&A* 670, A88 (Feb. 2023).

2022

- [7] “**Classification of 3 accreting binaries with VLT/X-Shooter spectra**”
T. Bouchet, S. Chaty, **F. Fortin**, and J. A. Tomsick. *MNRAS* 517.2 (Dec. 2022), pp. 3034–3044.
- [6] “**Finding the birthplace of HMXBs in the Galaxy using Gaia EDR3.**”
F. Fortin, F. García, and S. Chaty. *A&A* 665, A69 (Sept. 2022).
- [5] “**Constraints to neutron-star kicks in high-mass X-ray binaries with Gaia EDR3**”
F. Fortin, F. García, S. Chaty, E. Chassande-Mottin, and A. Simaz Bunzel. *A&A* 665, A31 (Sept. 2022).

2020

- [4] “**Broad-band energy distribution of the X-ray transient Swift J1745-26 from outburst to quiescence**”
S. Chaty, **F. Fortin**, and A. López-Oramas. *A&A* 637, A2 (May 2020).
- [3] “**Optical and Infrared Study of the Obscured B[e] Supergiant High-mass X-Ray Binary IGR J16318-4848**”
F. Fortin, S. Chaty, and A. Sander. *ApJ* 894.2, 86 (May 2020).

2019

- [2] “**Chandra-HETGS Characterization of an Outflowing Wind in the Accreting Millisecond Pulsar IGR J17591-2342**”
M. A. Nowak, A. Paizis, G. K. Jaisawal, J. Chenevez, S. Chaty, **F. Fortin**, J. Rodriguez, and J. Wilms. *ApJ* 874.1, 69 (Mar. 2019).

2018

- [1] “**Spectroscopic identification of INTEGRAL high-energy sources with VLT/ISAAC**”
F. Fortin, S. Chaty, A. Coleiro, J. A. Tomsick, and C. H. R. Nitschelm. *A&A* 618, A150 (Oct. 2018).

Articles submitted to A-rank journals

2023

- [4] “**A catalogue of low-mass X-ray binaries in the Galaxy: from the INTEGRAL to the Gaia era**”
F. Fortin, A. Kalsi, F. García, A. Simaz Bunzel, and S. Chaty. *A&A* (2023).
- [3] “**Spectroscopic multi-wavelength study and modeling of the Be/X-ray binary IGR J06074+2205**”
C. Dubos, S. Chaty, F. Fortin, and J. Tomsick. *A&A* (2023).
- [2] “**Multi-wavelength characterization of the nature and orbit of the Be/XRB IGR J01572-7259**”
J. Marchioro, S. Chaty, and F. Fortin. *A&A* (2023).
- [1] “**Accretion-induced changes in stellar companions of high-mass X-ray binaries**”
A. Simaz-Bunzel, F. García, F. Fortin, S. Chaty, and J. A. Combi. *A&A* (2023).

Conference proceedings

2023

- [6] “**Probing binary evolution in accreting high-mass systems**”
F. Fortin, F. García, A. Simaz-Bunzel, S. Chaty, and E. Chassande-Mottin. *SF2A-2023: Proceedings of the Annual meeting of the French Society of Astronomy and Astrophysics*. Dec. 2023, pp. 487–490.
- [5] “**Rewinding the history of high-mass X-ray binaries with Gaia**”
F. Fortin, F. García, A. Simaz-Bunzel, S. Chaty, and E. Chassande-Mottin. *SF2A-2023: Proceedings of the Annual meeting of the French Society of Astronomy and Astrophysics*. Dec. 2023, pp. 87–90.

2022

- [4] “**Constraints to Neutron-Star kicks in High-Mass X-ray Binaries with Gaia EDR3**”
F. Fortin, F. García, S. Chaty, E. Chassande-Mottin, and A. Simaz-Bunzel. *44th COSPAR Scientific Assembly. Held 16-24 July*. Vol. 44. July 2022, p. 1921.
- [3] “**Optical and infrared study of the obscured B[e] supergiant High-Mass X-ray Binary IGR J16318-4848**”
F. Fortin, S. Chaty, and A. Sander. *44th COSPAR Scientific Assembly. Held 16-24 July*. Vol. 44. July 2022, p. 1924.

2019

- [2] “**The dark side of supergiant High-Mass X-ray Binaries**”
Sylvain Chaty, F. Fortin, F. García, and F. Fogantini. *High-mass X-ray Binaries: Illuminating the Passage from Massive Binaries to Merging Compact Objects*. Ed. by Lidia M. Oskinova, Enrico Bozzo, Tomasz Bulik, and Douglas R. Gies. Vol. 346. Dec. 2019, pp. 161–169.
- [1] “**Chandra-HETGS Characterization of an Outflowing Wind in the accreting millisecond pulsar IGR J17591-2342**”
M. A. Nowak, A. Paizis, G. K. Jaisawal, J. Chenevez, S. Chaty, F. Fortin, J. Rodriguez, and J. Wilms. *AAS/High Energy Astrophysics Division*. Vol. 17. AAS/High Energy Astrophysics Division. Mar. 2019, 112.78, p. 112.78.

Astronomer’s Telegrams

2023

- [2] “**Identification of the optical/nIR counterpart of IGR J13402-6428 as an AGN at z=0.9202**”
F. Fortin, S. Chaty, and J. A. Tomsick. *The Astronomer’s Telegram* 16099 (June 2023), p. 1.

2017

- [1] “**Confirmation of IGR J17445-2747 infrared counterpart**”
F. Fortin, S. Chaty, and J. A. Tomsick. *The Astronomer’s Telegram* 10284 (Apr. 2017), p. 1.



Seminars (*invited)

2023

- [3] **“A catalogue of X-ray binaries to understand their evolution”**
GALHECOS, Observatoire Astronomique de Strasbourg (Apr. 2023).
- [2] **“The formation of High-Mass X-ray Binaries: natal kick and migration through the Galaxy”**
IRAP/GAHEC, Toulouse (Feb. 2023).
- [1] **“*Observing the history of binary star systems”**
IAS, Orsay (Jan. 2023).

Oral contributions (*invited)

2024

- [20] **“Galactic X-ray binaries and the potential of Colibri on SFXTs”**
Colibri Science Meeting (Jan. 2024).

2023

- [19] **“The population of compact objects in X-ray binaries”**
ENGRAVE webinar (Nov. 2023).
- [18] **“*An inventory of X-ray binaries and compact objects in the Galaxy”**
Atelier objects compacts et ondes gravitationnelles, Observatoire de Meudon, Paris (Nov. 2023).
- [17] **“SVOM/CAGIRE: CAPturing Gamma-ray bursts InfraRed Emission”**
NYRIA workshop, Marseille (Nov. 2023).
- [16] **“An inventory of Galactic compact objects in X-ray binaries”**
Compact objects meeting, IRAP/GAHEC, Toulouse (Nov. 2023).
- [15] **“*An inventory of X-ray binaries and compact objects in the Galaxy”**
GdR Ondes Gravitationnelles, Observatoire de Meudon, Paris (Oct. 2023).
- [14] **“On the history of High-Mass X-ray binaries through the Milky Way with Gaia”**
SF2A, Strasbourg (June 2023).
- [13] **“Probing the evolution of X-ray binaries”**
SF2A, Strasbourg (June 2023).
- [12] **“A catalogue of High-Mass X-ray Binaries in the Galaxy”**
Jeudi de l'APC, Paris (Apr. 2023).
- [11] **“A catalogue of High-Mass X-ray Binaries in the Galaxy”**
ENGRAVE webinar (Mar. 2023).
- [10] **“*A catalogue of High-Mass X-ray Binaries in the Galaxy”**
X-Wind webinar (Mar. 2023).

2022

- [9] **“Deriving neutron star kicks in HMXBs with Gaia EDR3”**
GdR Ondes Gravitationnelles, IRAP, Toulouse (Oct. 2022).
- [8] **“Finding the birthplace of HMXBs in the Milky Way using Gaia EDR3”**
ENGRAVE webinar (Oct. 2022).
- [7] **“Constraints to neutron star kicks in HMXBs with Gaia EDR3”**
COSPAR, Athens (July 2022).
- [6] **“Optical and infrared study of the most obscured B[e]sgHMXB”**
COSPAR, Athens (July 2022).

- [5] **“Binary rEvolution: from binary evolution towards the merging of compact objects”**
LabEx UnivEarthS, IGP, Paris (July 2022).
- [4] **“Constraints to neutron star kicks in HMXBs with Gaia EDR3”**
PHAROS, Roma (May 2022).
- [3] **“Finding the birthplace of HMXBs in the Milky Way using Gaia EDR3”**
AHE group meeting, APC, Paris (Apr. 2022).

2021

- [2] **“Constraints to neutron star kicks in HMXBs with Gaia EDR3”**
ENGRAVE webinar (Dec. 2021).
- [1] **“Deriving neutron star kicks in HMXBs with Gaia EDR3”**
GdR Ondes Gravitationnelles, Annecy (Oct. 2021).