



Pierre Marchand

Postdoc researcher in astrophysics

Experience

Research

- Since Dec 2019 **Postdoc**, *American Museum of Natural History*, New-York, USA.
Star formation simulations with non-ideal MHD, grain physics and chemistry
- Oct 2017 – Oct 2019 **Postdoc**, *Osaka University*, Osaka, Japan, JSPS Fellowship.
Star formation simulations with non-ideal MHD.
- Oct 2014 – Sep 2017 **PhD Thesis**, *CRAL*, Lyon, France.
Study of physical processes involved in star formation.
 - Numerical simulations (Fortran 90, AMR, Parallel Computing),
 - Non-ideal Magnetohydrodynamics,
 - Chemistry.
- Mar-Jul 2013 **Internship**, *CRAL*, Lyon, France.
Study of the pulsations of gaseous planets.
- May-Jul 2012 **Internship**, *Tohoku University*, Sendai, Japan.
Study of the light profiles of distant galaxies from observational data.

Teaching

- Jul. 2020 **Supervision of internships**, *American Museum of Natural History*, New-York, USA.
6 weeks of research internships for future Earth Science Teachers.
- 2015 – 2017 **Teaching assistant in mathematics**, *Université Claude Bernard Lyon 1*, Lyon, France.
Tutorial classes and oral examinations in first and second year of University (192h).
- 2015 **Teaching assistant in sustainable development**, *Université Claude Bernard Lyon 1*, Lyon, France.
Short lectures on energy sources for second year students (7x90min).
- 2013 – 2017 **Private tuitions**, *Methodia*, Lyon & Paris, France.
Private tuitions for students in mathematics and physics from Middle School to 3rd year of University. Training classes in mathematics to prepare competitive examinations.

08/10/1990 – French – 1 child (2016)

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Publications and communications

Published papers

- 2020 Guillet V., Hennebelle P., Pineau des forêts G., Marcowith A., Commerçon B., **Marchand P.** 2020, A&A (in press) : *Dust coagulation feedback on magnetohydrodynamic resistivities in protostellar collapse.*
- 2020 **Marchand P.**, Tomida K., Tanaka K.E.I., Commerçon B., Chabrier G. 2019, ApJ (in press) : *Protostellar collapse: regulation of the angular momentum and onset of an ionic precursor..*
- 2019 **Marchand P.**, Tomida K., Commerçon B., Chabrier G. 2018, A&A, 631, A66 : *Impact of the Hall effect in star formation, improving the angular momentum conservation.*
- 2018 **Marchand P.**, Commerçon B., Chabrier G. 2018, A&A, 619, A37 : *Impact of the Hall effect in star formation and the issue of angular momentum conservation.*
- 2016 Hennebelle P., Commerçon B., Chabrier G. & **Marchand P.** 2016, ApJ, 830L, 8H : *Magnetically Self-regulated Formation of Early Protoplanetary Disks.*
- 2016 **Marchand P.**, Masson J., Chabrier G., Hennebelle P., Commerçon B., & Vaytet N. 2016, A&A, 592, A18 : *Chemical solver to compute molecule and grain abundances and non-ideal MHD resistivities in prestellar core-collapse calculations.*

Conferences and seminars

- Dec 2019 Seminar at American Museum of Natural History, New-York, USA: *Chemistry and regulation of the angular momentum in star formation.*
- Sep 2019 Seminar at Center for Computational Astrophysics (CCA), New-York, USA: *Regulating the angular momentum in star formation.*
- Sep 2019 Oral presentation at "GothamFest", New-York, USA: *Regulating the angular momentum in star formation.*
- Aug 2019 Seminar at Kagoshima University, Kagoshima, Japan: *Regulating the angular momentum in star formation.*
- Mar 2019 Seminar at University of Western Ontario, London, Canada: *Chemistry and the Hall effect in star formation.*
- Mar 2019 Seminar at Princeton University, Princeton, USA: *Chemistry and the Hall effect in star formation.*
- Nov 2018 Seminar at Tokyo University, Tokyo, Japan: *Chemistry and non-ideal MHD for star formation.*
- Sep 2018 Seminar at IPAG, Grenoble, France: *The Hall effect in star formation.*
- Sep 2018 Oral presentation at the RAMSES User Meeting, Lyon, France: *The Hall effect in RAMSES for star formation.*
- Mar 2018 Seminar at Kyushu University, Fukuoka, Japan: *The Hall effect in star formation.*
- Jun 2016 Oral presentation at the Astronomy and Astrophysics French Society (SF2A), stellar physics session (PNPS), Lyon, France: *Chemistry and non-ideal MHD in star formation.*

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Sep 2015 Oral presentation at the RAMSES User Meeting, Oxford, United Kingdom: *The Hall effect in RAMSES*.

Jun 2015 Poster session at the *Disc Dynamics & Planet Formation* conference, Lanarka, Cyprus: *Chemistry for non-ideal MHD*.

Outreach

Jun 2020 Participation to an astronomy panel for high school students for the end of their rocket project, New-York, USA.

Feb 2020 Scientific consultant for the French translation of the new planetarium show of the American Museum of Natural History "Worlds Beyond Earth".

Jun 2019 Conference on star formation for high school students, Takamatsu, Japan.

Dec 2018 Conference on the life cycle of stars for 2nd year scientific high school students, Kawanishi, Japan.

Apr 2015, 2016, 2017 "Astro week", Accompanying high school students to visit the planetarium, computing center and Lyon observatory, France.

2015 – 2017 Presentation of the astrophysics department at ENS of Lyon and astronomy-related subjects for visiting middle and high school students (~10x90 minutes).

May 2016 Presentation of astronomy subjects for 10 years old elementary school children (90 minutes).

Mar 2012 "Nuit de l'équinoxe", Stand at a public gathering of the astronomy clubs of Lyon.

Education

Sep 2013 – **Master Degree in Astronomy and Astrophysics**, *Paris observatory*.

Oct 2014 Theoretical astrophysics (fluid mechanics, radiative transfer, computational astrophysics). Ranking: 7th/33.

Sep 2010 – **Engineering degree**, *École Centrale*, Lyon.

Sep 2013 Specialised in Energy (electrical network, nuclear energy).

Sep 2008 – **Classes préparatoires**, *Lycée Chaptal*, Paris.

Jun 2010 Intensive courses of mathematics and physics to prepare competitive examinations. Accepted in École Centrale de Lyon.

Computer skills

Advanced Fortran 90, L^AT_EX

Intermediate PYTHON, Office, Linux, Microsoft Windows

Basic Parallel Computing, HTML, CSS, C++, Matlab, MAPLE, Blender

Languages

French **Mother tongue**

English **Fluent**

Japanese **Conversational**

Spanish **Basic**

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