






Artem Aguichine

(He/Him)

Fluent in English, French, and Russian.
Beginner level Italian and Spanish.

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RESEARCH EXPERIENCE

- 2025 – PRES. **Associate Professor**
Instituto de Astronomía UNAM, Ensenada, Mexico
- 2022 – 2025 **Postdoctoral Researcher**
Funded by NASA's Interdisciplinary Consortia for Astrobiology Research (ICAR).
Advisor: Prof. Natalie Batalha
University of California, Santa Cruz, California, USA
- 2019 – 2022 **PhD in Planetary Science**
at Laboratoire d'Astrophysique de Marseille (LAM)
Advisor: Prof. Olivier Mousis
Aix-Marseille University, Marseille, France
- 2019 **M. Sc. summer internship in planetary science**, (4 months)
Laboratoire d'Astrophysique de Marseille, Marseille, France
- 2017 **M. Sc. summer internship in planetary science**, (6 months)
Laboratoire d'Astrophysique de Marseille, Marseille, France
- 2016 **M. Sc. summer internship in nuclear physics**, (3 months)
Institut de Physique Nucléaire d'Orsay, Orsay, France
- 2015 **B. Sc. summer internship in cosmology**, (5 weeks)
Centre de Physique des Particules de Marseille, Marseille, France

EDUCATION

- 2019 – 2022 **PhD in Astronomy and Astrophysics**, at Laboratoire d'Astrophysique de Marseille (LAM)
Aix-Marseille Université, Marseille, France
- 2019 **M. Sc. in theoretical physics**, at Centre de Physique Théorique
Aix-Marseille Université, Marseille, France
- 2019 **M. Sc. in Fundamental Physics**, at Ecole Normale Supérieure de Paris-Saclay
Ecole Normale Supérieure de Paris-Saclay, Cachan, France
- 2018 **Master degree for Education in Higher Education, Laureate of Agrégation de Physique (rank 16/72)**
Ecole Normale Supérieure de Paris-Saclay, Cachan, France

AWARDS AND DISTINCTIONS

- 2023 **Workshop participation support for Uranus Flagship 2023**
Coverage of participation costs up to \$2,500, July 25-27, 2023, in Pasadena, California.
- 2023 **Thesis Award from the Doctoral School of Physics and Material Sciences (ED352) of Aix-Marseille University**
Award given to the 10% most impactful theses defended in 2022
- 2018 **Laureate of Agrégation de Physique with rank 16/72**
- 2014 **Study grant (4 years) at École Normale Supérieure de Paris-Saclay**

FACILITATION OF RESEARCH

- 2021 – PRES. **Reviewer** for *ApJ*, *ApJL*, *A&A Letters*, *SSRev*, *EPJL* and *MNRAS*
- 2023 – 2025 **Postdoc Representative**, in the Astronomy Department at UCSC
- 2022 – 2025 **Astrobiology Colloquium Organizer**, in the Astronomy Department at UCSC

- 2025 **Press-release** of Aguichine et al. 2025 on the evolution of Steam Worlds. [Link to full text](#) ↗.
- 2022 **Press-release** of Aguichine et al. 2022 on the formation of Jupiter. [Link to full text](#) ↗.
- 2020 **Press-release** of Aguichine et al. 2020 on rocklines. [Link to full text](#) ↗.
- 2020 **Press-release** of Mousis et al. 2020 on highly irradiated ocean worlds. [Link to full text](#) ↗.
- 2019 – 2020 **Journal Club Organizer**, in the GSP group at Laboratoire d'Astrophysique de Marseille

TEACHING

- 2026 **Instructor, Semester 1 of 2026**
– **Characterization of Exoplanet Composition (CECo)** (6 credits, M. Sc.) : 48 hours of lectures
Instituto de Astronomía, UNAM
- 2025 **Instructor, Spring 2025 quarter**
– **Practical Programming for the Sciences (ASTR19)** (5 credits, undergrad) : 32 hours of lectures
University of California, Santa Cruz
- 2024 **Instructor, Winter 2024 quarter**
– **Practical Programming for the Sciences (ASTR19)** (5 credits, undergrad) : 32 hours of lectures
University of California, Santa Cruz
- 2024 – 2025 **Instructor at Project for Inmate Education (PIE)**
– Pre-Algebra and Algebra classes given to inmates of the Santa Cruz County Jail
University of California, Santa Cruz
- 2019 – 2022 **Teaching Assistant and Instructor**, in B. Sc. (154 h) and M. Sc. (40 h)
– **General Physics (L1)** : 54h tutorials, 12h lab
– **Electromagnetism (L2)** : 24h tutorials, 28h lab
– **Advanced Studies in Physics (L3)** : 36h lectures, 12h lab
– **Preparation for Agrégation (M2)** : 4h lectures, 8h tutorials, 28h lab
Aix-Marseille Université
- 2018 – 2019 **Examiner for oral exams in preparatory classes (50 h)**
Lycées Thiers and Jean-Perrin, Marseille, France
- 2016 – 2022 **Private tutoring in math and physics for high school and preparatory classes**
– 1 on 1 tutoring (~220 h)
– intensive courses (~200 h)
Groupe Réussite ↗

RESEARCH MENTORING

- 2025 – PRES **Advisor:**
– Hailey Feller, B. Sc., since May 2025.
University of California, Santa Cruz
- 2024 – PRES **Advisor:**
– Lily Larkins, B. Sc., since July 2024. 5 college credits earned in 2025 for independent research.
– Emerson Tao, B. Sc., since July 2024. 5 college credits earned in 2025 for independent research.
University of California, Santa Cruz
- W& SPR 2025 **Research project with a group of 5 undergraduate students**
As part of the ASTR9 course (6 months, 5 credits)
University of California, Santa Cruz
- SUM 2024 **co-Advisor with Jonathan Fortney:**
– Sierra Elbert, B. Sc., 2 months
University of California, Santa Cruz
- W& SPR 2024 **Research project with a group of 5 undergraduate students**
As part of the ASTR9 course (6 months, 5 credits)
University of California, Santa Cruz
- SUM 2023 **co-Advisor with Jonathan Fortney and Nadine Nettelmann:**
– Emma Postolec, M2 (6 months)
University of California, Santa Cruz

- SUM 2022 **Advisor:**
 – Manon Bertoglio, LI, 1 month
 – Lucas Le Gall, LI, 1 month
Laboratoire d'Astrophysique de Marseille
- SUM 2022 **co-Advisor with Olivier Mouis:**
 – Tom Benest, M2, 5 months
 – Udomlerd Srisuchinwong, M2, 5 months
Laboratoire d'Astrophysique de Marseille
- SUM 2021 **Advisor:**
 – Clément Caquet, LI, 1 month
 – Solène Four, LI, 1 month
Laboratoire d'Astrophysique de Marseille
- SUM 2021 **co-Advisor with Olivier Mouis:**
 – Antoine Schneeberger, M2, 5 months
 – Udomlerd Srisuchinwong, M2, 5 months
Laboratoire d'Astrophysique de Marseille
- SUM 2020 **co-Advisor with Olivier Mouis:**
 – Antoine Schneeberger, M2, 5 months
 – Hugo Vivien, M2, 5 months
Laboratoire d'Astrophysique de Marseille

OUTREACH

- JAN 2026 **Video interview** for the web series SETI Live. [Link to recording](#).
- 2024 – 2025 **Ask An Astronomer** at UCSC: asking questions sent by email from the general public
- 2023 – 2025 **Astronomy on Tap Organiser** at UCSC to promote science and astrophysics to the general public
- AUG 2025 **Public talk** at the Lick Observatory, Mt Hamilton, CA, USA. [Link to recording](#).
- AUG 2022 **Interview** for the newspaper La Marseillaise. [Link to full text](#).
- MAY 2022 **Interview** for the online journal The Daily Beast. [Link to full text](#).
- APR 2022 **Public conference** for the association Observatoire Astronomique du Gros Cerveau, Ollioules, France
- 2020 – PRES. **School presentations** to promote science and astrophysics
- 2019 – PRES. **Participation in public events** to promote science and astrophysics
- DEC 2021 **Public conference** for the association Andromède
- APR 2021 **Video interview** for the web series CPublié. [Link to recording](#).
- JUN 2020 **Public conference** on the Twitch channel Tout Se Comprend. [Link to recording](#).

TECHNICAL SKILLS

- Languages:
Fortran 95, Python, C/C++, JavaScript, HTML, PHP
- Scientific libraries:
NumPy, SciPy, Astropy, Matplotlib, TensorFlow, emcee, pandas
- Software engineering:
Git, GitHub, multiprocessing, Linux
- Numerical methods:
Interpolation, Vectorization, Root Finding, MCMC, ML

NOTABLE SCIENTIFIC PRODUCTIONS

Scientific products:

2. **Grids of evolutionary tracks for steam worlds** based on the work described in **Aguichine et al. 2025** Zenodo.
1. **Grids of interior structure models for steam worlds** based on the work described in **Aguichine et al. 2021** Zenodo.

Community tools:

3. **Developer of MARDIGRAS (Mass-Radius DIaGRAM with Sliders):** <https://github.com/anowen/MARDIGRAS>
Aguichine A. (2024), "mardigras: A Visualization Tool of Theoretical Mass–Radius Relations in the Context of Planetary Science", *Research Notes of the American Astronomical Society*, 8, 216, doi:10.3847/2515-5172/ad7506. Zenodo.
2. **Contributor for MR-plotter (mass-radius plotter):** <https://github.com/castro-gzlj/mr-plotter>
1. **Developer and coordinator of the EOS Database.** Collaboration guidelines: Google Doc.
Project started in April 2026. First prototype: <https://github.com/anowen/thermo-database/>.

SCIENCE COMMUNICATION

- MAY 2026 **Invited talk** at the Instituto de Astronomía Seminar.
Instituto de Astronomía, UNAM, Ensenada, Mexico. Participants : 50.
- APR 2026 **Contributed talk** at the Layers of Understanding conference at the MPIA.
Max Planck Institute of Astronomy (MPIA), Heidelberg, Germany. Participants : 50.
- OCT 2025 **Invited talk** at the STRAND meeting at UC San Diego.
UC San Diego, CA, USA. Participants : 15.
- JUL 2025 **Two Contributed talks** at the SF2A Conference.
Toulouse, France. Participants : 300.
- JUN 2025 **Contributed talk + Poster** at the 2025 PLATO meeting
Marseille, France. Participants : 70.
- JUN 2024 **Contributed talk + Poster** at the Exoplanets 5 Conference
Leiden, Netherlands. Participants : 750.
- JUN 2024 **Invited talk** at the Exoplanets 5 mini-Symposium at Kapteyn University.
Kapteyn, Netherlands. Participants : 25.
- JUN 2024 **Two Contributed talks** at the SF2A Conference.
Marseille, France. Participants : 300.
- MAR 2024 **Invited talk** at the Earth and Planetary Laboratory Seminar, in Carnegie Science.
Washington DC, USA. Participants : 20.

And 16 other contributed talks, posters, and invited talks.

SCIENTIFIC PUBLICATIONS

Publications in high-impact peer-reviewed journals (ADS Link):

41. **Aguichine A.**, Nimmo F. (2026), "Thermal effects on the bulk density of rocky planets: the Earth-like composition band", *The Astrophysical Journal Letters*, **in prep**.
40. **Aguichine A.**, Mousis O. (2026), "Saturn's formation at the Carbon Dioxide Iceline", *The Planetary Science Journal*, **accepted with minor revisions**.
39. Meech A., Gao P., Wallack N. L., et al. (**19th author**) (2026), "JWST COMPASS: A NIRSpec G395H Transmission Spectrum of Radius Valley Dweller TOI-260 b", *The Astronomical Journal*, 171, 274, doi:10.3847/1538-3881/ae472f.
38. Chakrabarty A., Mulders G. D., **Aguichine A.**, et al. (2026), "The Radius Cliff is a Waterfall: Explaining Sub-Neptune Exoplanets with Steam Worlds", *The Astrophysical Journal*, 999, 188, doi:10.3847/1538-4357/ae3da8.
37. Wallack N. L., Gao P., Greklek-McKeon M., et al. (**5th author**) (2026), "JWST COMPASS: NIRSpec/G395H Transmission Observations of the Sub-Neptune HD 13337 c", *The Astronomical Journal*, 171, 180, doi:10.3847/1538-3881/ae2d12.
36. Gordon T. A., Batalha N. M., Batalha N. E., et al. (**4th author**) (2026), "JWST COMPASS: Insights into the Systematic Noise Properties of NIRSpec/G395H from a Uniform Reanalysis of Seven Transmission Spectra", *The Astronomical Journal*, 171, 178, doi:10.3847/1538-3881/ae3de9.
35. Adams Redai J., Wogan N., Wallack N. L., et al. (**5th author**) (2025), "JWST COMPASS: A NIRSpec G395H Transmission Spectrum of the Super-Earth GJ 357 b", *The Astronomical Journal*, 170, 219, doi:10.3847/1538-3881/adee92.
34. **Aguichine A.**, Batalha N., Fortney J. J., et al. (2025), "Evolution of Steam Worlds: Energetic Aspects", *The Astrophysical Journal*, 988, 186, doi:10.3847/1538-4357/add935.

33. Schmerling H., Goffo E., Grziwa S., et al. (**11th author**) (2025), "The TOI-2427 system: Two close-in planets orbiting a late K-dwarf star", *Astronomy and Astrophysics*, 699, A185, doi:10.1051/0004-6361/202452620.
32. Teske J., Batalha N. E., Wallack N. L., et al. (**8th author**) (2025), "JWST COMPASS: NIRSpec/G395H Transmission Observations of TOI-776 c, a 2 R_⊕ M Dwarf Planet", *The Astronomical Journal*, 169, 249, doi:10.3847/1538-3881/adb975.
31. Alderson L., Moran S. E., Wallack N. L., et al. (**10th author**) (2025), "JWST COMPASS: NIRSpec/G395H Transmission Observations of the Super-Earth TOI-776 b", *The Astronomical Journal*, 169, 142, doi:10.3847/1538-3881/adad64.
30. Balsalobre-Ruza O., Lillo-Box J., Silva A. M., et al. (**14th author**) (2025), "KOBE-1: The first planetary system from the KOBE survey: Two planets likely residing in the sub-Neptune mass regime around a late K-dwarf", *Astronomy and Astrophysics*, 694, A15, doi:10.1051/0004-6361/202452631.
29. Alam M. K., Gao P., Adams Redai J., et al. (**6th author**) (2025), "JWST COMPASS: The First Near- to Mid-infrared Transmission Spectrum of the Hot Super-Earth L 168-9 b", *The Astronomical Journal*, 169, 15, doi:10.3847/1538-3881/ad8eb5.
28. Luu C. N., Yu X., Glein C. R., et al. (**5th author**) (2024), "Volatile-rich Sub-Neptunes as Hydrothermal Worlds: The Case of K2-18 b", *The Astrophysical Journal*, 977, L51, doi:10.3847/2041-8213/ad9eb1.
27. Scarsdale N., Wogan N., Wakeford H. R., et al. (**7th author**) (2024), "JWST COMPASS: The 3–5 μm Transmission Spectrum of the Super-Earth L 98-59 c", *The Astronomical Journal*, 168, 276, doi:10.3847/1538-3881/ad73cf.
26. Benest Couzinou T., Mousis O., Danger G., et al. (**5th author**) (2024), "Journey of complex organic molecules: Formation and transport in protoplanetary disks", *Astronomy and Astrophysics*, 692, A10, doi:10.1051/0004-6361/202449499.
25. Castro-González A., Lillo-Box J., Armstrong D. J., et al. (**5th author**) (2024), "TOI-5005 b: A super-Neptune in the savanna near the ridge", *Astronomy and Astrophysics*, 691, A233, doi:10.1051/0004-6361/202451656.
24. Mousis O., Schneeberger A., Cavalié T., et al. (**5th author**) (2024), "Insights on the Formation Conditions of Uranus and Neptune from Their Deep Elemental Compositions", *The Planetary Science Journal*, 5, 173, doi:10.3847/PSJ/ad58d8.
23. Wallack N. L., Batalha N. E., Alderson L., et al. (**6th author**) (2024), "JWST COMPASS: A NIRSpec/G395H Transmission Spectrum of the Sub-Neptune TOI-836c", *The Astronomical Journal*, 168, 77, doi:10.3847/1538-3881/ad3917.
22. Sulis S., Crossfield I. J. M., Santerne A., et al. (**7th author**) (2024), "A low-mass sub-Neptune planet transiting the bright active star HD 73344", *Astronomy and Astrophysics*, 688, A14, doi:10.1051/0004-6361/202449559.
21. Mousis O., Cavalié T., Lunine J. I., et al. (**6th author**) (2024), "Recipes for Forming a Carbon-Rich Giant Planet", *Space Science Reviews*, 220, 44, doi:10.1007/s11214-024-01071-4.
20. Alderson L., Batalha N. E., Wakeford H. R., et al. (**5th author**) (2024), "JWST COMPASS: NIRSpec/G395H Transmission Observations of the Super-Earth TOI-836b", *The Astronomical Journal*, 167, 216, doi:10.3847/1538-3881/ad32c9.
19. Castro-González A., Demangeon O. D. S., Lillo-Box J., et al. (**9th author**) (2023), "An unusually low-density super-Earth transiting the bright early-type M-dwarf GJ 1018 (TOI-244)", *Astronomy and Astrophysics*, 675, A52, doi:10.1051/0004-6361/202346550.
18. Georgieva I. Y., Persson C. M., Goffo E., Acuña L., **Aguichine A.**, et al. (2023), "TOI-733 b: A planet in the small-planet radius valley orbiting a Sun-like star", *Astronomy and Astrophysics*, 674, A117, doi:10.1051/0004-6361/202345961.
17. Schneeberger A., Mousis O., **Aguichine A.**, et al. (2023), "Evolution of the reservoirs of volatiles in the protosolar nebula", *Astronomy and Astrophysics*, 670, A28, doi:10.1051/0004-6361/202244670.
16. Lillo-Box J., Gandolfi D., Armstrong D. J., et al. (**18th author**) (2023), "TOI-969: a late-K dwarf with a hot mini-Neptune in the desert and an eccentric cold Jupiter", *Astronomy and Astrophysics*, 669, A109, doi:10.1051/0004-6361/202243879.
15. Persson C. M., Georgieva I. Y., Gandolfi D., Acuña L., **Aguichine A.**, et al. (2022), "TOI-2196 b: Rare planet in the hot Neptune desert transiting a G-type star", *Astronomy and Astrophysics*, 666, A184, doi:10.1051/0004-6361/202244118.
14. **Aguichine A.**, Mousis O., Lunine J. I., (2022), "The Possible Formation of Jupiter from Supersolar Gas", *The Planetary Science Journal*, 3, 141, doi:10.3847/PSJ/ac6bfi.
13. Vivien H., **Aguichine A.**, Mousis O., Deleuil M., Marcq E., (2022), "On the Stability of Low-mass Planets with Supercritical Hydrospheres", *The Astrophysical Journal*, 931, 143, doi:10.3847/1538-4357/ac66e2.
12. Acuña L., Lopez T. A., Morel T., et al. (**6th author**) (2022), "Water content trends in K2-138 and other low-mass multi-planetary systems", *Astronomy and Astrophysics*, 660, A102, doi:10.1051/0004-6361/202142374.
11. Mousis O., Lunine J. I., **Aguichine A.** (2021), "The Nature and Composition of Jupiter's Building Blocks Derived from the Water Abundance Measurements by the Juno Spacecraft", *The Astrophysical Journal*, 918, L23, doi:10.3847/2041-8213/ac1d50.
10. Hoyer S., Gandolfi D., Armstrong D. J., Deleuil M., et al. (**20th author**) (2021), "TOI-220 b: a warm sub-Neptune discovered by TESS", *Monthly Notices of the Royal Astronomical Society*, 505, 3361, doi:10.1093/mnras/stab1427.
9. **Aguichine A.**, Mousis O., Deleuil M., Marcq E. (2021), "Mass-Radius Relationships for Irradiated Ocean Planets", *The Astrophysical Journal*, 914, 84, doi:10.3847/1538-4357/abfa99.
8. Mousis O., **Aguichine A.**, Bouquet A., Lunine J. I., Danger G., Mandt K. E., Luspay-Kuti A. (2021), "Cold Traps of Hypervolatiles in the Protosolar Nebula at the Origin of the Peculiar Composition of Comet C/2016 R2 (PanSTARRS)", *The Planetary Science Journal*, 2, 72, doi:10.3847/PSJ/abeaa7.

7. Acuña L., Deleuil M., Mousis O., Marcq E., Levesque M., **Aguichine A.** (2021), "Characterisation of the hydrospheres of TRAPPIST-1 planets", *Astronomy and Astrophysics*, 647, A53, doi:10.1051/0004-6361/202039885.
6. Mousis O., **Aguichine A.**, Helled R., Irwin P. G. J., Lunine J. I. (2020), "The role of ice lines in the formation of Uranus and Neptune", *Philosophical Transactions of the Royal Society of London Series A*, 378, 20200107, doi:10.1098/rsta.2020.0107.
5. **Aguichine A.**, Mousis O., Devouard B., Ronnet T. (2020), "Rocklines as Cradles for Refractory Solids in the Protosolar Nebula", *The Astrophysical Journal*, 901, 97, doi:10.3847/1538-4357/abaf47.
4. Mandt K. E., Mousis O., Lunine J., Marty B., Smith T., Luspay-Kuti A., **Aguichine A.** (2020), "Tracing the Origins of the Ice Giants Through Noble Gas Isotopic Composition", *Space Science Reviews*, 216, 99, doi:10.1007/s11214-020-00723-5.
3. Mousis O., **Aguichine A.**, Atkinson D. H., Atreya S. K., Cavalié T., Lunine J. I., Mandt K. E., Ronnet T. (2020), "Key Atmospheric Signatures for Identifying the Source Reservoirs of Volatiles in Uranus and Neptune", *Space Science Reviews*, 216, 77, doi:10.1007/s11214-020-00681-y.
2. Mousis O., Deleuil M., **Aguichine A.**, Marcq E., Naar J., Aguirre L. A., Brugger B., Gonçalves T. (2020), "Irradiated Ocean Planets Bridge Super-Earth and Sub-Neptune Populations", *The Astrophysical Journal*, 896, L22, doi:10.3847/2041-8213/ab9530.
1. Santerne A., Brugger B., Armstrong D. J., Adibekyan V., Lillo-Box J., Gosselin H., **Aguichine A.**, Almenara J.-M., et al. (2018), "An Earth-sized exoplanet with a Mercury-like composition", *Nature Astronomy*, 2, 393, doi:10.1038/s41550-018-0420-5.