

Kaustubh Hakim

STAFF RESEARCHER

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Employment

02.2023 – present **Staff Researcher**, University of Leuven (KU Leuven) and Royal Observatory of Belgium
02.2019 – 01.2023 **Postdoctoral Researcher**, University of Bern, Bern, Switzerland
09.2014 – 12.2018 **PhD Candidate**, University of Amsterdam, Amsterdam, Netherlands
07.2014 – 08.2014 **Summer Researcher**, Nicolaus Copernicus Astronomical Center, Warsaw, Poland
07.2010 – 08.2012 **Analyst**, Nomura Investment Bank, Mumbai, India
07.2010 – 08.2012 **Intern**, IBM, Bangalore, India

Education

University of Amsterdam / VU Amsterdam

Amsterdam, Netherlands

PHD, ASTROPHYSICS & GEOCHEMISTRY (AWARDED ON 18.12.2018)

12.2018

KU Leuven

Leuven, Belgium

MSc, ASTRONOMY & ASTROPHYSICS

07.2014

Indian Institute of Technology Kharagpur

Kharagpur, India

BTECH, ELECTRONICS ENGINEERING

07.2010

Awards & Distinctions

2021 **NCCR PlanetS, Switzerland**, Research Project Grant
2021 **Swiss Society of Astronomy & Astrophysics**, Travel Award
2020 **University of Bern**, Young Academics Support Award
2014 **KU Leuven**, MSc with *magna cum laude*
2010 **IIT Kharagpur**, BTech with *Honours*
2006 **Engineering Entrance Examination, India**, 99.97 %tile among 0.5 million candidates

Publications

PEER-REVIEWED

Narang, M., Oza, A. V., **Hakim, K.**, Puravankara, M., Tyagi, H., Banerjee, B., Surya, A., Nayak, P.K., Banyal, R.K., Thorngren, D.P. (2023), uGMRT observations of the hot-Saturn WASP 69b: Radio-Loud Exoplanet-Exomoon Survey II (RLEES II), *Monthly Notices of the Royal Astronomical Society* 522, 2 [journal] [arXiv]
Konrad, B.S., Alei, E., Quanz, S.P., Mollière, P., Angerhausen, D., Fortney, J.J., **Hakim, K.**, Jordan, S., Kitzmann, D., Rugheimer, S., Shorttle, O., Wordsworth, R., and the LIFE Collaboration (2023), Large Interferometer For Exoplanets (LIFE): IX. Assessing the impact of clouds on atmospheric retrievals at mid-infrared wavelengths with a Venus-twin exoplanet, *Astronomy & Astrophysics* [journal] [arXiv]
Hakim, K., Tian, M., Bower, D.J., Heng, K. (2023), Diverse Carbonates in Exoplanet Oceans Promote the Carbon Cycle, *Astrophysical Journal Letters* 942, L20 [journal] [arXiv]
Narang, M., Oza, A. V., **Hakim, K.**, Puravankara, M., Banyal, R., Thorngren, D. (2023), Radio-Loud Exoplanet-Exomoon Survey (RLEES): GMRT Search for Cyclotron Maser Emission, *Astronomical Journal* 165, 1 [journal] [arXiv]
Bower, D. J., **Hakim, K.**, Sossi, P. A., Sanan, P. (2022), Retention of water in terrestrial magma oceans and carbon-rich early atmospheres, *Planetary Science Journal* 3, 93 [journal] [arXiv]

- Hakim, K.**, Bower, D. J., Tian, M., Deitrick, R., Auclair-Desrotour, P., Kitzmann, D., Dorn, C., Mezger, K., Heng, K. **(2021)**, Lithologic Controls on Silicate Weathering Regimes of Temperate Planets, *Planetary Science Journal* 2, 49 [journal] [arXiv]
- Hakim, K.**, van den Berg, A., Vazan, A., Höning, D., van Westrenen, W., Dominik, C. **(2019)**, Thermal evolution of rocky exoplanets with a graphite outer shell, *Astronomy & Astrophysics* 630, A152 [journal] [arXiv]
- Hakim, K.**, Spaargaren, R., Grewal D.S., Rohrbach A., Brendt J., Dominik, C., van Westrenen, W. **(2019)**, Mineralogy, structure and habitability of carbon-enriched rocky exoplanets: A laboratory approach, *Astrobiology* 19, 7 [journal] [arXiv]
- Hakim, K.**, van Westrenen, W., Dominik, C. **(2018)**, Capturing the oxidation of silicon carbide in rocky exoplanetary interiors, *Astronomy & Astrophysics* 618, L6 [journal] [arXiv]
- Hakim, K.**, Rivoldini, A., Van Hoolst, T., Cottenier, S., Jaeken, J., Chust, T., Steinle-Neumann, G. **(2018)**, A new ab initio equation of state of hcp-Fe and its application to the interior structure and mass-radius relation of rocky super-Earths, *Icarus* 313, 61–78 [journal] [arXiv]

THESES

- Hakim, K. (2018)**, Diving Deep Into Rocky Exoplanets, *University of Amsterdam, Netherlands*
- Hakim, K. (2014)**, The Interior Structure of Super-Earths, *KU Leuven, Belgium*
- Hakim, K. (2010)**, Performance Evaluation of s-MAC protocol for Wireless Sensor Networks, *IIT, Kharagpur, India*

Selected Presentations

- Hakim, K. (2022, keynote talk)**, Chemically-Diverse Exoplanet Interiors and Interior-Atmosphere Interactions, *NOVA NW2 Meeting, Groningen, Netherlands*
- Hakim, K. (2022, invited talk)**, Carbon and Sulfur in Exoplanetary Interiors, *HP4 Workshop, Brussels, Belgium*
- Hakim, K. (2022, invited review talk)**, Exoplanetary Interiors and Evolution, *PFE-SPP1992 joint meeting, Berlin, Germany*
- Hakim, K. (2022, colloquium)**, Chemistry of Planetary Interiors and Surfaces, *National Institute of Science Education and Research, Bhubaneswar, India*
- Hakim, K.**, Bower, D. J., Tian, M., Deitrick, R., Auclair-Desrotour, P., Kitzmann, D., Dorn, C., Mezger, K., Heng, K. **(2021, talk)**, A Lithology-based Silicate Weathering Model for Earth-like Planets, *European Geosciences Union General Assembly (virtual)*
- Hakim, K.**, Tian, M., Auclair-Desrotour, P., Deitrick, R., Bower, D. J., Kitzmann, D., Dorn, C., Mezger, K., Heng, K. **(2020, talk)**, A Weathering Framework to Model the Inorganic Carbon Cycle on Rocky Exoplanets, *American Astronomical Society Meeting (virtual)*
- Hakim, K. (2020, plenary talk)**, Geochemistry of Carbon Cycles on Rocky Exoplanets III, *Exoplanets Conference (virtual)*
- Hakim, K. (2020, seminar)**, Application of Geosciences to Exoplanets, *Tata Institute of Fundamental Research, Mumbai, India*
- Hakim, K. (2019, poster)**, Geochemistry of Carbon Cycles on Rocky Exoplanets, *Extreme Solar Systems 4, Reykjavik, Iceland*
- Hakim, K.**, van den Berg, A., Vazan, A., Höning, D., van Westrenen, W., Dominik, C. **(2019, talk)**, Thermal evolution of rocky exoplanets covered with graphite, *Division of Planetary Sciences – Europlanet Science Congress, Geneva, Switzerland*
- Rivoldini, A., **Hakim, K.**, Van Hoolst, T., Cottenier, S., Jaeken, J., Chust, T., Steinle-Neumann, G. **(2017, poster)**, A New Ab Initio Equation of State of hcp-Fe and Its Implication on the Interior Structure and Mass-Radius Relations of Rocky Super-Earths, *American Geophysical Union Fall Meeting, Nans, USA*
- Hakim, K. (2017, seminar)**, A laboratory approach to probe the mineralogy of carbon-enriched rocky exoplanets, *University of Chicago, USA*
- Hakim, K.**, van Westrenen, W., Dominik, C. **(2017, talk)**, Mineralogy of Carbon-Enriched Rocky Extra-Solar Planets from Laboratory Experiments, *Lunar and Planetary Science Conference, Houston, Texas*
- Hakim, K.**, Rivoldini, A., Van Hoolst, T., Cottenier, S., Chust, T., Steinle-Neumann, G. **(2017, talk)**, A New Ab Initio Equation of State of hcp-Iron and Its Application to the Interior Structure of Rocky Super-Earths, *Lunar and Planetary Science Conference, Houston, Texas*

Teaching Experience

- 2020 – 2021 **Radiative Transfer**, Teaching Assistant / Co-Lecturer, *MSc Physics*
2018 **Planetary Science**, Co-Lecturer, *MSc Earth Sciences*
2015 – 2017 **Interstellar Medium**, Teaching Assistant, *MSc Astronomy & Astrophysics*

Supervision Experience

- 2021 – present **Lukas Carmichael**, MSc Thesis, ETH Zürich (Co-Advisor)
2020 – present **Mark Oosterloo**, PhD Thesis, University of Groningen / VU Amsterdam (External Advisor)
2018 **Dieke Bentjees**, BSc Thesis, VU Amsterdam (Co-Advisor)
2016 **Rob Spaargaren**, BSc Thesis, VU Amsterdam (Co-Advisor)

Service, Leadership and Professional Development

PEER REVIEW FOR HIGH-IMPACT JOURNALS

Journal of Geophysical Research
Astronomy & Astrophysics
Monthly Notices of Royal Astronomical Society
Planetary Science Journal
Geochimica et Cosmochimica Acta

LEADERSHIP ROLES

- 2023 **Session Convener**, Goldschmidt Conference, Lyon, France
2022 **Working Group Coordinator**, NCCR PlanetS Phase 3
2022 – 2023 **Session Convener**, European Geosciences Union General Assembly, Vienna, Austria
2019 – 2022 **Working Group Organiser**, Atmosphere-Interior Exchange, University of Bern
2016 – 2017 **PhD Representative**, PhD-PostDoc Council, University of Amsterdam, Netherlands
2015 – 2017 **Meeting Organiser**, Interdisciplinary PEPSci Network, Netherlands
2012 – 2014 **Student Representative**, Permanent Education Committee, KU Leuven

DEVELOPMENT COURSES

Lessons in leadership, University of Bern, How to keep your team motivated
Project Management for Researchers, NCCR PlanetS, How to drive collaborative projects successfully
Public Speaking for Scientists, University of Bern, Effectively connect your scientific content with the audience

SCIENCE COMMUNICATION

Outreach Contribution, Planets in the Solar System, Astronomy Calendar (2021)
Public Science Talk, Cooking Tiny Planets in the Lab, Astronomy on Tap, Bern, Switzerland (2019)
Blog Writing, The Role of Geosciences in Exoplanet Science, European Geosciences Union Blogs (2019)
Magazine Contribution, A New Ultra-High-Pressure Equation Of State For Iron Gives Insight Into Super-Earth Interiors, Science Trends (2018)
Student Engagement Talk, Carbon-rich exoplanets, Universidad de los Andes, Bogotá, Colombia (2016)
Volunteer, Public Stargazing Nights, University of Amsterdam (2015–2017)

PROFESSIONAL MEMBERSHIPS

International Astronomical Union
European Geosciences Union
European Association of Geochemistry