Kaustubh Hakim

Senior Scientist / Research Expert

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Employment

02.2023 – present	**Research Expert (staff member, 0.5 FTE)**, University of Leuven (KU Leuven)
02.2023 – present	**Senior Scientist (work leader, 0.5 FTE)**, 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
05.2009 – 07.2009	**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

2023	**BELSPO FED-tWIN Research Program, Belgium**, Career Grant
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

Gillmann, C., **Hakim, K.**, Lourenco, D., Quanz, S., Sossi, P. **(2024)**. Interior Controls on the Habitability of Rocky Planets. *Space: Science & Technology 4, 0075* [journal]

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. (2024, invited seminar), Chemical Diversity in Rocky Interiors and Interior-Atmosphere Interactions, *Exoplanet Seminar Series, NASA Goddard Space Flight Center, USA (virtual)*

Hakim, K. (2023, invited lecture), Chemistry of Rocky Worlds and Sub-Neptunes, *ATOMIUM Meeting, KU Leuven, Belgium*

Hakim, K. (2023, invited review talk), Astronomical Windows into Planetary Interiors and Evolution, *Strange New Worlds Exoplanet Conference, IISER Pune, India*

Hakim, K. (2023, invited talk), Impact of Refractory Carbon on Rocky Exoplanet Mineralogy, Evolution & Habitability, *VLTI MATISSE Science Team Meeting (virtual)*

Hakim, K. (2022, keynote talk), Chemically-Diverse Exoplanet Interiors and Interior-Atmosphere Interactions, *NOVA NW2 Meeting, Groningen, Netherlands (virtual)*

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, invited seminar), 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. (2020, plenary talk), Geochemistry of Carbon Cycles on Rocky Exoplanets, *Exoplanets III 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, Reykyavik, 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*

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

2023 – present **Ine Malfait**, MSc Thesis, KU Leuven (Advisor)
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

Astrobiology, 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

2018 – present **Junior Member**, International Astronomical Union
2019 – present **Member**, European Geosciences Union
2020 – present **Member**, European Association of Geochemistry