Kaustubh Hakim

Scientific Researcher / 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	**Scientific Researcher (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 Award
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

Peer-Reviewed Publications

Hakim, K. (2024). Positive Weathering Feedback Compensates Carbonates at Shallow Ocean Depths, IAU Symposium, Vol. 382 (2024) pp. 123–125 [journal]

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] [arXiv]

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]

Selected Presentations

Hakim, K. (2024, invited talk), Exoplanet Ocean Chemistry Under Carbonate-Silicate Cycling, *Venus Workshop, Austrian Academy of Sciences, Graz, Austria*

Hakim, K. (2024, invited seminar), Magma-Atmosphere Coupling in Hot Sub-Neptunes, *Institute for Particle Physics and Astrophysics, ETH Zurich, Switzerland*

Hakim, K. (2024, invited talk), The Need for Ab Initio and Laboratory Simulations in Exoplanet Science, *Netherlands Astronomers' Conference 2024, Egmond aan Zee, Netherlands*

Hakim, K. (2024, invited lecture), Chemical Diversity in Rocky Exoplanets & Sub-Neptunes from Laboratory and Ab Initio Simulations *2024 ATSOA Summer Training School, ARIES, Nainital, India*

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

Hakim, K. (2020, invited seminar), Application of Geosciences to Exoplanets, *Tata Institute of Fundamental Research, Mumbai, India*

Hakim, K., van den Berg, A., Vazan, A., Höning, D., van Westrenen, W., Dominik, C. **(2019, contributed 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, contributed talk)**, Mineralogy of Carbon-Enriched Rocky Extra-Solar Planets from Laboratory Experiments, *Lunar and Planetary Science Conference, Houston, Texas*

Teaching Experience

2024 – present **Physics and Chemistry of Planets**, Co-Lecturer, *MSc Astro. & Astrophy.*, KU Leuven
2020 – 2021 **Radiative Transfer**, Teaching Assistant / Co-Lecturer, *MSc Physics*, University of Bern
2018 **Planetary Science**, Co-Lecturer, *MSc Earth Sciences*,VU Amsterdam
2015 – 2017 **Interstellar Medium**, Teaching Assistant, *MSc Astro. & Astrophy.*, University of Amsterdam

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

Reviewing Service for Funding Agencies and High-Impact Journals

NASA ROSES, Université Paris Cité, Astrobiology, Journal of Geophysical Research, Astronomy & Astrophysics, Monthly Notices of Royal Astronomical Society, Planetary Science Journal, Geochimica et Cosmochimica Acta, Open Research Europe, Applied Geochemistry

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

Selected Outreach and Education

2024 **Co-Lecturer**, Starquakes and Exoplanets in the Milky Way, Junior College STEM Course, KU Leuven
2023 **Podcast Guest**, Dark Matter Podcast on YouTube, Friends of Europe, Brussels
2021 **Outreach Contribution**, Planets in the Solar System, Astronomy Calendar
2019 **Public Science Talk**, Cooking Tiny Planets in the Lab, Astronomy on Tap Bern
2019 **Blog Writing**, The Role of Geosciences in Exoplanet Science, European Geosciences Union Blogs
2018 **Magazine Contribution**, A New Ultra-High-Pressure Equation Of State For Iron, Science Trends
2016 **Student Engagement Talk**, Carbon-rich exoplanets, Universidad de los Andes, Bogotá, Colombia
2015 **Volunteer**, Public Stargazing Nights, University of Amsterdam

Professional Memberships

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