

1) Curriculum Vitae - Hans Huybrighs

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Scientific career

2019-2022, ESA postdoctoral research fellow, ESA/ESTEC, the Netherlands

- Europa's water plumes and the interaction of energetic ions with Io's and Europa's atmosphere
- Scientific preparations of the Jupiter ICy moon Explorer ([JUICE](#)) mission.
- Project management tasks in collaboration with JUICE project scientist
 - Design of JUICE information database
 - Lead the design and implementation of the JUICE acronym database
- Part of review committee for large grants (several 10k)

Education

PhD, 2015-2018 **Physics, Magna Cum Laude**

Thesis: "A search for signatures of Europa's atmosphere and plumes in Galileo charged particle data"

Max Planck Institute of Solar System Research, Göttingen, Germany; Swedish Institute of Space Physics (IRF), Kiruna, Sweden; Braunschweig University of Technology, Germany

MSc, 2012-2015 **Aerospace Engineering: Space Flight, Cum Laude**

Thesis: "The feasibility of in-situ observations of Europa's water vapour plumes"

Delft University of Technology, the Netherlands

BSc, 2008-2012 **Aerospace Engineering**

Delft University of Technology, the Netherlands

Awards and distinctions

- 2020: Nominated for the PhD cup (www.phdcup.be). Belgian science communication competition for recent PhD graduates. Selected as 1 of 16 nominees out of 81 applications.
- 2020: Editors' Pick in AGU Advances digest for Huybrighs et al., 2020.
- 2020: Europlanet Science Congress - Science Flash - First Prize, three-minute improvised science presentation.
- 2019: Famelab Delft winner: competition where scientists present their research in three minutes. Participated in Dutch national finals.
- 2014: '*Bronzen Galileiprijs*': awarded by Belgian astronomy society for contributions to the popularisation of astronomy.

Grants

ESA postdoctoral research fellowship (2019-2021)

"Activity and variability of the Galilean icy moons' exospheres: measurements, modelling and predictions in the context of the JUICE mission". Funding per year: three conferences and two research visits.

Educational tasks

2019 – now: **supervision** of students as main supervisor

- 2 BSc students (2.5 months summer 2019, summer 2020)
- 1 MSc student (Sept. 2019 - June 2020), University Leiden

2020: **mentoring** of undergraduate student at EPSC conference

2018-2019: guest **seminar** for students BSc/MSc, at the university of Delft, the university of Leiden and the Wellington Institute of Technology (New Zealand)

Memberships

- Jupiter ICy moon Explorer (JUICE) geophysics working group
- Jupiter ICy moon Explorer (JUICE) magnetosphere working group
- Europlanet Society, EGU, AGU

Contributions to the scientific community

Organisation of scientific conferences

- 2021: Session chair 'Particle Acceleration and Loss in the Earth and Planetary Magnetospheres' (COSPAR)
- 2020: Lead co-organiser: Two-day workshop on 'Outer planet moon-magnetosphere interaction' at ESA/ESTEC ([link](#))
- 2020: Session convenor 'Environments of outer planet moons: particles, plasma, fields and dust': European Planetary Science Congress (EPSC), Granada/online
- 2020: Early career events (social event, course on future research). EPSC, Granada/online
- 2020: Session co-convenor 'Particle and plasma interactions in the ionospheres, exospheres and at surfaces of solar system bodies': European Geophysical Union General Assembly, Vienna/online
- 2019: Session co-convenor 'Ocean Worlds and Icy Moons': EPSC, Genève.
- 2017: local organizing committee & co-convenor: Rocks and Stars II, Göttingen

Other

- 2019 – now. Founding of research fellow network at ESTEC
- 2019 – now. Europlanet Early Career Network: working group on future research. Connect early career researchers to future research (organising talks, writing articles, conducting interviews...)

Journal reviewer

- For Journal of Geophysical Research, Space Physics

Additional skills and training

Science communication: PhD cup media training (4 days, 2020), TU Delft Science Communication training session (two half days, 2019), FameLab Masterclass in Science Communication (two days, 2019)

Space topics: Design of Space Missions and Systems (five-day internal ESA course, 2020), EU & Space Policy (one day ESA internal course, 2020), Ladybird guide to Spacecraft Operations (four-day ESA internal course, 2019)

COSPAR Leadership Workshop 2021 (3 half days)

Languages: Dutch (native), English (fluent), French (basic), Swedish (very basic)

Science communication

- Since 2016, presentations: ~one talk per month to a non-scientific audience (adults/kids) for schools, public observatories and others (science festival) in different countries (Belgium, the Netherlands, Germany, New Zealand and Iceland).
- Since 2019, writing popular scientific articles ([EOS wetenschap](#), Dutch language science magazine)
- Since 2019, Cultural collaborations: lecture with Jazz trio, space sarau with dancers and musicians, lecture astronomy and navigation (cultural collaboration Volkenkunde museum Leiden and Maori, native New Zealanders).
- Since 2016, science workshop for kids, design and performance
- Answering questions of journalists (de Volkskrant, Dutch radio, het Belang van Limburg, Gizmodo). Podcast day of science Belgium, 2020.
- Science shows (ESA open day 2019, Göttingen Night of Science 2017, hundreds of participants)
- Tours at the scientific institutes where I work

2008 - 2015, **Youth organisation for astronomy** Descartes (Cosmodrome Genk, Belgium) Make kids and teenagers passionate about astronomy. Active members: 40-50. Workload: 6-8hrs/week. Activities every two weeks, summer camp, spring camp.

- 2010-2013, president of organisation (3 years)
- 2011: responsible for the astronomy introduction course (>30 participants, 10 lessons)
- 2012: responsible for ten-day astronomy youth camp
- 2012: responsible for the yearly gathering of Belgian astronomy clubs with lecture of ESA astronaut Frank De Winne (>100 participants)
- Since 2015: coaching of new generation of volunteers

2) Scientific publications

Peer reviewed publications: 3

Publications in preparation: 5

White papers: 1

h-index: 2

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- **H. L. F. Huybrighs**, E. Roussos, A. Blöcker, N. Krupp, Y. Futaana, S. Barabash, L. Z. Hadid, M. K. G. Holmberg, O. Lomax and O. Witasse. (2020). An Active Plume Eruption on Europa During Galileo Flyby E26 as Indicated by Energetic Proton Depletions. *Geophysical Research Letters*
<https://doi.org/10.1029/2020GL087806>
Citations: 2. Impact factor: 4.5
- Gianluca Carnielli, M Galand, François Leblanc, L Leclercq, Ronan Modolo, A Beth, **H.L.F. Huybrighs**, X Jia. (2019) First 3D test particle model of Ganymede's ionosphere. *Icarus*. <https://doi.org/10.1016/j.icarus.2019.04.016>
Citations: 6. Impact factor: 3.513
- **H.L.F. Huybrighs**, Y. Futaana, S. Barabash, M. Wieser, P. Wurz, N. Krupp, K-H. Glassmeier, B. Vermeersen. (2017). On the in-situ detectability of Europa's water vapour plumes from a flyby mission. *Icarus*.
<https://doi.org/10.1016/j.icarus.2016.10.026>
Citations: 5. Impact factor: 3.513

In preparation

- One in review, one in preparation

Publications by my students

- Three in preparation

White papers (non-peer reviewed)

- F. Crary, G.B. Clark, P. Delamere, C. Dong, R.W. Ebert, C. Harris, G Hospodarsky, S. Hsu, **H. Huybrighs**, A. Kotova, T. Livengood, C. Paranicas, K. Retherford, E. Roussos, Y. Sarkango, J. Saur, J.R. Szalay, M. Vogt and L. Wang. (2020) The Magnetosphere of Jupiter: Moving from Discoveries Towards Understanding. White paper for NASA decadal survey.

3) Scientific presentations

Oral presentations at international conferences: 9

Poster presentations at international conferences: 14

Research seminars: 11

Invited oral presentations at scientific conferences

- **H.L.F. Huybrighs**, E. Roussos, N. Krupp, M. Fraenz, Y. Futaana, S. Barabash. *Signatures of Europa's Atmosphere in Galileo Data*. Asia-Oceania Geophysics Society Congress 2019. Singapore.

Oral presentations at scientific conferences

- **H. Huybrighs**, C. van Buchem, A. Blöcker, E. Roussos, N. Krupp, V. Dols, Y. Futaana, S. Barabash, O. Witasse, M. Holmberg. *Plumes and atmospheric charge exchange as a cause of energetic ion losses near Europa and Io*. COSPAR Scientific Assembly. January 2021, Sydney, Australia.
- **H.L.F. Huybrighs**, E. Roussos, N. Krupp, M. Fraenz, Y. Futaana, S. Barabash. *Signatures of Europa's atmosphere in Galileo EPD data*. Outer planet moon-magnetosphere interactions 2019, Selfoss, Iceland.
- **H.L.F. Huybrighs**, Elias Roussos, Norbert Krupp, Markus Fraenz, Yoshifumi Futaana, Stas Barabash, Karl-Heinz Glassmeier. *Are there signatures of active Europa plumes in Galileo in-situ data?* European Planetary Science Congress 2017, Vienna, Austria.
- **H. Huybrighs**, E. Roussos, N. Krupp, M. Fränz, Y. Futaana, S. Barabash, K.-H. Glassmeier. *The search for signatures of Europa plumes in Galileo in-situ data*. Rocks 'n' Stars II, 2017, Göttingen, Germany.
- **H. Huybrighs**, Y. Futaana, S. Barabash, M. Wieser, P. Wurz, N. Krupp, E. Roussos, M. Fränz, K.-H. Glassmeier, and B. Vermeersen. *Feasibility study of the in-situ detectability of Europa's neutral and plasma plumes from a flyby mission*. Europa-Enceladus Plumes Workshop, Caltech, October 15, 2016.
- **H. Huybrighs**, Y. Futaana, S. Barabash, M. Wieser, P. Wurz, N. Krupp, K.-H. Glassmeier, and B. Vermeersen. *Feasibility study of in-situ measurements of Europa's neutral and plasma plumes with JUICE/PEP*. In: Geophysical Research Abstracts Vol. 18, EGU2016-13425, 2016 EGU General Assembly 2016, Vienna.

Poster presentations at scientific conferences

- **H. Huybrighs**, A. Blöcker, E. Roussos, C. van Buchem, N. Krupp, Y. Futaana, S. Barabash, M. Holmberg, and O. Witasse. *Energetic proton depletions near Europa: the effect of plumes, atmospheric charge exchange, Alfvén wings and the wake*. American Geophysical Union Fall Meeting 2020.
- **H. Huybrighs**, A. Blöcker, E. Roussos, C. van Buchem, N. Krupp, Y. Futaana, S. Barabash, M. Holmberg, O. Witasse. *Energetic proton depletions near Europa: the effect of plumes, atmospheric charge exchange, Alfvén wings and the wake*. Outer planet moon - magnetosphere interaction workshop 2020. ESA/ESTEC
- **H. Huybrighs**, A. Blöcker, E. Roussos, C. van Buchem, N. Krupp, Y. Futaana, S. Barabash, M. Holmberg, and O. Witasse. *Energetic proton depletions near Europa: plumes, atmospheric charge exchange and Alfvén wings*. European Planetary Science Congress 2020. Granada/Online.
- M. Holmberg, F. Cipriani, G. Déprez, C. Imhof, O. Witasse, N. Altobelli, **H. Huybrighs**, and J.-E. Wahlund. *Variability of the plasma environment of the Jovian magnetosphere and implications for future particle and fields*

measurements by JUICE. European Planetary Science Congress 2020. Granada/Online.

- **H. Huybrighs**, C. van Buchem, A. Blöcker, E. Roussos, N. Krupp, V. Dols, F. Yoshifumi, S. Barabash, O. Witasse, M. Holmberg. *Energetic ion depletions near Europa and Io: the effect of plumes and atmospheric charge exchange*. European Geophysical Congress 2020, Vienna/online
- M. Holmberg, F. Cipriani, **H. Huybrighs**, L. Hadid, G. Deprez. *How are the Cassini in-situ measurements affected by the presence of the spacecraft? Spacecraft - plasma interaction simulation results compared to in-situ measurements*. The 16th Spacecraft Charging Technology Conference 2020, Florida, US.
- **H. Huybrighs**, E. Roussos, N. Krupp, M. Fränz, Y. Futaana, S. Barabash, A. Blöcker, V. Dols, and O. Witasse. *Energetic ion depletions near the Galilean moons: atmospheric interaction and indications of the charge state*. European Planetary Science Congress, 2019, Geneva.
- **H.L.F. Huybrighs**, E. Roussos, N. Krupp, M. Fraenz, Y. Futaana, S. Barabash, K.-H. Glassmeier. *Signatures of Europa's atmosphere in Galileo EPD data during the E12 flyby*. Magnetospheres of Outer Planets 2018.
- G. Carnielli, M. Galand, R. Modolo, F. Leblanc, A. Beth, **H.L.F. Huybrighs**, X. Jia. *Constraining Ganymede's neutral and plasma environment through numerical simulations of its ionosphere*. Magnetospheres of Outer Planets 2018.
- G. Carnielli, M. Galand, R. Modolo, F. Leblanc, A. Beth, **H.L.F. Huybrighs**, X. Jia. *Constraining Ganymede's exosphere through numerical simulations of its ionosphere and Galileo observations*. European Planetary Science Congress 2018
- **H.L.F. Huybrighs**, E. Roussos, N. Krupp, M. Fraenz, Y. Futaana, S. Barabash, K.-H. Glassmeier. *The search for active Europa plumes in Galileo plasma particle detector data: the E12 flyby*. AGU fall meeting 2017. New Orleans, US.
- **H. Huybrighs**, E. Roussos, N. Krupp, M. Fraenz, Y. Futaana, S. Barabash, K.-H. Glassmeier. *The search for Europa plume signatures in Galileo plasma particle data*. Magnetospheres of Outer Planets 2017. Uppsala, Sweden.
- N. Krupp, M. Fraenz, E. Roussos, **H. Huybrighs**, S. Barabash, P.C. Brandt, C. Paranicas, D.G. Mitchell, Joseph Westlake, K. Khurana, X. Jia. *Electron measurements in the low latitude magnetosphere of Jupiter and in the vicinity of the Galilean moons: Current knowledge and future investigations with the PEP JEI and JoEE sensors onboard the JUICE spacecraft*. Magnetospheres of Outer Planets 2017. Uppsala, Sweden.
- **H. Huybrighs**, E. Roussos, N. Krupp, M. Fraenz, Y. Futaana, S. Barabash, and K.-H. Glassmeier. *The search for Europa plume signatures in Galileo in-situ data*. DPG Frühjahrstagung 2017 (German Physical Society Spring Meeting), Bremen, March 14, 2017.

Oral presentations by students supervised by me

- R. Dayton-Oxland, **H. Huybrighs**, A. Mahieux, D. Goldstein, T. Winterhalder. *Impact of using a collisional plume model on detecting Europa's water plumes from a flyby*. Outer planet moon - magnetosphere interaction workshop 2020. ESA/ESTEC
- C. van Buchem, **H. Huybrighs**, A. Blöcker, V. Dols, O. Witasse, and Y. Miguel. *Energetic proton depletion near Io: atmospheric charge exchange and inhomogeneous magnetic and electric fields*. European Planetary Science Congress 2020. Granada/Online.

Invited research seminars

- Europa's water plumes. Technical University of Delft. October 2020. **Invited**
- Europa's water plumes. European Space Agency Science Seminar. June 2020. **Invited**
- Europa's water plumes. Advanced concepts team European Space Agency. April 2020. **Invited**
- How do Jupiter's icy moons interact with the magnetosphere? Leiden University, July 2019. **Invited**
- Europa's water plumes, will we get to detect them with JUICE? ESAC, June 2019. **Invited**
- Europa's plumes and atmosphere, what we can (still) learn from Galileo's charged particle data. Technical University of Delft. March 2019. **Invited**
- *Getting something out of nothing. The search for Europa plume signatures in Galileo particle detector data.* Swedish Institute of Space Physics (IRF). 8th of June 2017. **Invited**

Research seminars

- Signatures of plumes and atmospheric charge exchange in energetic ion data from Europa. ESA, November 2019.
- *Tasting Europa's ocean The search for Europa plume signatures in Galileo particle detector data.* Max Planck Institute for Solar System Research. 10th of May 2017.
- *In-situ detectability of Europa's water vapour plumes.* Max Planck Institute for Solar System Research. 6th of July 2016.
- *Tasting Europa's ocean: the feasibility of in-situ observations of Europa's water vapour plumes.* Swedish Institute of Space Physics (IRF). 19th of Nov 2015. *PEP internal charging study: the results.* Swedish Institute of Space Physics (IRF). 20th of Feb 2014.

4) Overview science communication

Outreach talks since 2016: 44

Popular science articles: 9

Presentations to non-scientific audiences (since 2016)

- Lecturers without borders. 23 March 2021
- Skype a scientist. St. Mary's Visitation, Elm Grove. 24 February 2021.
- Skype a scientist. St. Mary Parish School, Menomonee Falls. 10 February 2021.
- Skype a scientist. St. Mary Parish School, Menomonee Falls. 5 February 2021.
- Skype a scientist. Basilica School of Saint Mary. 27 January 2021
- Skype a scientist 2x. Basilica School of Saint Mary. 21 January 2021
- Skype a scientist. Dobbs Ferry High School. 21 December 2020.
- Buitenaards detectivewerk (online), Cozmix, Brugge. 9 December 2020
- Alien detective work. VVS/JVS weekend. Cosmodrome, Genk. 3 October 2020
- Alien detective work, PhD cup semi-finals, Brussels. 23 September 2020
- Manen van ijs en vuur (Moons of Ice and Fire). Sound of Science, science festival, 6 September 2020. (cancelled because of pandemic)
- Online presentation and Q&A about Starlink en BepiColombo. Youth organisation for Astronomy, Belgium, 3 May 2020
- Twintigduizend mijlen onder een buitenaardse zee (Twenty thousand leagues under an alien ocean). Sterrenwacht Copernicus. 16 April 2020 (cancelled because of pandemic)
- Manen van ijs en vuur (Moons of Ice and Fire). Descartes youth symposium. 28 March 2020 (cancelled because of pandemic)
- Online astronomy Q&A. International School of Amsterdam. 23 March 2020
- Watervulkanen op Europa, proeven van een buitenaardse oceaan (Water volcanoes on Europa, a taste of an extraterrestrial ocean). Galileo, KNVWS afd. Zuid-Limburg. 23 November 2019
- Moons of Ice and Fire. Space storytellers, ESA open day. Noordwijk, the Netherlands. 7 October 2019
- Science show exoplanets. ESA open day. Noordwijk, the Netherlands. 7 October 2019
- Science show moons. ESA open day. Noordwijk, the Netherlands. 7 October 2019
- Europa: a taste of an extraterrestrial ocean. Bessensap 2019, Amsterdam, the Netherlands. 21 June 2019
- Moons of Ice and Fire. Astronomy on Tap Leiden ([video](#)), the Netherlands. 27 May 2019
- Watervulkanen op Europa, proeven van een buitenaardse oceaan (Water volcanoes on Europa, a taste of an extraterrestrial ocean). JWG Leiden, Nederland. 10 May 2019
- Moons of Ice and Fire. Nederlandse Famelab Finale NL ([video](#)). Tivoli, Utrecht, the Netherlands. 9 May 2019
- Europa: a taste of an extraterrestrial ocean ([video](#)). Winning presentation Famelab Delft. 3 April 2019.
- Water volcanoes on Europa, tasting an extraterrestrial ocean. Sunnulækjarskóli, Selfoss, IJsland. 11 February 2019.
- Water volcanoes on Europa, tasting an extraterrestrial ocean.
- New Zealand Astrobiology Network (NZAN), Lower Hutt, New Zealand. 2 November 2018
- Water volcanoes on Europa, tasting an extraterrestrial ocean.
- Water volcanoes on Europa, tasting an extraterrestrial ocean. Taita College, Lower Hutt, New Zealand. 2 November 2018.
- Water volcanoes on Europa, tasting an extraterrestrial ocean. Auckland Astronomical Society. Auckland, New Zealand. 22 October 2018.

- Watervulkanen op Europa, proeven van een buitenaardse oceaan (Water volcanoes on Europa, a tast of an extraterrestrial ocean). Cosmodrome, Genk, Belgium. 15 March 2018.
- Water volcanoes on Europa, tasting an extraterrestrial ocean. Otto-Hahn-Gymnasium, Göttingen, Germany. 30 November 2017.
- Planet 9. Summercamp JVS-Descartes, Zutendaal, Belgium. July 2017.
- Volcanism in the solar system, science show. Night of Science. Max Planck Institute for Solar System Research, Göttingen, Germany. 21 January 2017.
- Water volcanoes on Europa: tasting an extraterrestrial ocean. Science Slam. Max Planck Institute for Solar System Research, Göttingen, Germany. 15 July 2016.

Cultural collaborations

- Space sarau, Munganga theater, Amsterdam, 28 Mei 2020 (cancelled because of pandemic)
- Navigating by the stars. Maori weekend (visit of native New Zealanders), Museum Volkenkunde Leiden, 2 Mei 2020 (cancelled because of pandemic)
- Sounds of Interstellar Space, lecture with jazz trio Trifid ([website](#)). Noordwijk, Space Expo. 24 January 2020
- Sounds of Interstellar Space, lecture with jazz trio Trifid ([website](#)). Bovenkarspel, sterrenwacht Orion. 11 January 2020
- Sounds of Interstellar Space, lecture with jazz trio Trifid ([website](#)). Utrecht, sterrenwacht Sonnenborgh. 10 January 2020

Written science communication

Op-ed

- Kritische vragen over klimaatverandering zijn nuttig, maar we mogen niet in herhaling vallen (Critical questions about climate change are useful, but we shouldn't keep repeating ourselves, [link](#)). *Knack*, Januari 2019.

Popular scientific writing

- Buitenaards detectivewerk (Extraterrestrial detective work, [link](#)). EOS wetenschap. September 2020.
- Neen, de eerste bewoonbare exoplaneet kennen we nog niet (No, we haven't identified the first habitable exoplanet yet, [link](#)). EOS wetenschap. Augustus 2020.
- De leefbare zone bestaat niet (The habitable zone doesn't exist, [link](#)). EOS wetenschap. February 2020.
- Manen van ijs en vuur (Moons of ice and fire, [link](#)). EOS wetenschap. November 2019.
- Twintigduizend mijlen onder een buitenaardse zee (Twenty thousand leagues under an alien ocean, [link](#)). EOS wetenschap, September 2019
- Water volcanoes on Europa, a tast of an extraterrestrial ocean. Heelal, Januari 2019.
- Plumes on Europa - tasting an extraterrestrial ocean. Room, the space journal. April 2017.
- In-situ observations of Europa's plumes. Leonardo Times. April 2016.

Workshops

- Hoe weten we de Jupitermaan Europa een ondergrondse oceaan heeft? (How do we know that Jupiter's moon Europa has a subsurface ocean? Interactive online workshop). 14 November 2020, Jongerenvereniging voor Sterrenkunde, Belgium
- Hoe land ik op een andere planeet? (How to land on another planet) Sound of Science science festival. 5-6 September 2020 (cancelled because of pandemic)
- Hoe land ik op een andere planeet (how to land on another planet)? Kinderuniversiteit Antwerpen. 8 Maart 2020 (cancelled because of pandemic)
- Nepnieuws (fakenews): teach kids how to recognize fakenews and how to find reliable information on science. JVS-Descartes, Cosmodrome, Genk. 16 Maart 2019.
- Landen op een andere planet (how to land on another planet): Zomerkamp JVS-Descartes, Born *België*. 2014.