

Curriculum Vitae

Employment

2024

Postdoctoral Research Grant Holder, *National Institute of Astrophysics - Astronomical Observatory of Trieste*, Trieste, Italy

2023-24

Postdoctoral Research Fellow, *Tata Institute of Fundamental Research*, Mumbai, India
Department of Theoretical Physics

Education

2019-23

PhD in Physics, *The University of Nottingham*, Nottingham, UK

Supervisors: Dr James S Bolton, Dr Nina Hatch

Thesis: Simulating neutral hydrogen across cosmic time: the 21-cm forest in late reionization models and the global 21-cm signal at cosmic dawn

- Vice-Chancellor's Scholarship for Research Excellence
- Graduated July 2023

2014-19

MPhys in Physics, Astrophysics, *The University of Edinburgh*, Edinburgh, UK

- Graduated July 2019 with the First Class

2016-17

Exchange program, *California Institute of Technology*, Pasadena, USA

- GPA: 3.3

Observing Proposals

2026

PI of uGMRT Cycle 50 observations (ID: 50_010), *A uGMRT Band-2 Search for the 21-cm Forest 1D Power Spectrum at $z \simeq 5.8$* , 60 hr awarded

Software

2024

21cm-forest_1DPS repository, https://github.com/tomassoltinsky/21cm-forest_1DPS

Forward-modelling the 21-cm forest with instrumental features and compute its 1D power spectrum
Used in 2 publications

Technical and Academic Experience

2025

Refereeing scientific papers, for *A&A*, *PRL*, *PRD*

2023-24

In-Kind Directable Software Development for the LSST-DESC, *Tata Institute of Fundamental Research*, Mumbai, India

- Development of a code for calculating 3D trispectrum from N-body simulations

2018-19

MPhys Project, *The University of Edinburgh*, Edinburgh, UK

Extreme Variability of Active Galactic Nuclei ([report](#))

Supervisor: Prof Andy Lawrence

- Tested black hole accretion disc models in the context of extreme variability of AGN luminosity
- Included a public summary (created a [card game](#))

2018

Cormack Vacation Research Scholarship and Deans' Vacation Scholarship, *The Institute for Astronomy*, Edinburgh, UK

21cm Signal Marking the End of Dark Ages ([report](#), [poster](#))

Supervisor: Dr José Oñorbe

- Mock observations of global 21cm signal with focus on Dark Ages based on Nyx simulations

2018

Senior Honours Project, *The University of Edinburgh*, Edinburgh, UK

Scalar Field Dark Energy

Supervisor: Prof Andy Taylor

- Simulated the expansion of the universe driven by dark energy modeled as a dynamical scalar field

2017-18

Telescope Group Project, *The University of Edinburgh*, Edinburgh, UK

Measurement of the Characterising Properties of Exoplanet TrES-2b and its Host Star

Supervisor: Prof Philip Best

- Transit Photometry and Doppler Spectroscopy methods
- Observations performed with Edinburgh University's Meade MAX 20in ACF telescope

2017

Summer Undergraduate Research Fellowship, *Caltech*, Pasadena, USA

Redefining the Habitable Zone

Supervisor: Prof David J. Stevenson

- Determining conditions under which water in liquid phase can be present on the surface of a planet

2017

Research in Experimental Physics, *Caltech, LIGO*, Pasadena, USA

Signal Processing

Supervisor: Dr Thomas J. Massinger

- Data analysis and investigation of glitches in data

Publications

S K Patil, **T Šoltinský**, S Maitra, et al., "Efficient neutral-IGM inference from noisy 21-cm forest spectra with latent-space U-Net encoding and XGBoost", published in *MNRAS*, Volume 546, Issue 4, id.stag236, 18 pp., 2026. ([link](#))

T Šoltinský, G Kulkarni, S P Tendulkar, et al., "Prospects of a statistical detection of the 21-cm forest and its potential to constrain the thermal state of the neutral IGM during reionization", published in *MNRAS*, Volume 537, Issue 1, pp.364-378, 2025. ([link](#))

E Puchwein, J S Bolton, L C Keating, et al. "The Sherwood-Relics simulations: overview and impact of patchy reionization and pressure smoothing on the intergalactic medium", published in *MNRAS*, Volume 519, Issue 4, pp.6162-6183, 2023. ([link](#))

T Šoltinský, J S Bolton, M Molaro, et al. "Probing quasar lifetimes with proximate 21-centimetre absorption in the diffuse intergalactic medium at redshifts $z \geq 6$ ", published in *MNRAS*, Volume 519, Issue 2, pp.3027-3045, 2023. ([link](#))

T Šoltinský, J S Bolton, N Hatch, et al. "The detectability of strong 21-cm forest absorbers from the diffuse intergalactic medium in late reionization models", published in *MNRAS*, Volume 506, pp. 5818-5835, 2021. ([link](#))

C S Cockell, "Astrobiology: Understanding Life in the Universe", *Wiley-Blackwell*, 2015

- Contributed to and was cited in the Preface to the book

Awards, Scholarship, Grants

2019-22

Vice Chancellor's Scholarship for Research Excellence (EU), *The University of Nottingham*, Nottingham, UK

To support my PhD studies

2019

Students into the World grant, *The Tatra banka Foundation*, Slovakia

2018

RSE Cormack Undergraduate Astronomy Research Prize, *Royal Society of Edinburgh*, Edinburgh, UK

For the "21cm Marking the End of Dark Ages" project

2016

Year 2 Physics Class medal, *The University of Edinburgh*, Edinburgh, UK

For excellent performance during the 2015/16 session

2014

The memorial letter of St. Gorazd, *The Ministry of Education, Science, Research and Sport of the Slovak Republic*, Bratislava, Slovakia

For successful representation of the Slovak Republic at Austrian Young Physicists' Tournament and achievement of bronze medal

2014

Best in Natural Sciences school award, *Pavol Horov Gymnasium*, Michalovce, Slovakia

For representation of the school at various Physics and Maths competitions

Mentoring and Teaching

2021

Mentoring at GROWNi.sk, Slovakia

- Advising students in their career and study decisions

2016

Outreach talks, *Pavol Horov Gymnasium*, Michalovce, Slovakia

- "From LA through half the globe to simulated universe", Topic: career path and simulations in astrophysics
- "From LA to LA", Topic: gained experience and how to study abroad
- "Science has no borders", Topic: my research experience and ongoing research in the world

2023

Advanced 21-cm Cosmology School and Workshop, *National Institute of Science Education and Research*, Bhubaneswar, India, Lectures ([link](#))

Service to Academic Community

- 2023-24 ■ **State of the Universe Seminar Series Organizer**, *TIFR*, Mumbai, India
- 2022 ● **Astronomy Postgraduate Student Representative**, *The University of Nottingham*, Nottingham, UK
- Main point of communication between PG students and staff
- 2021-22 ■ **Lunch Talks Organizer**, *The University of Nottingham*, Nottingham, UK
- 2019-22 ■ **Physics Coursework Marker**, *The University of Nottingham*, Nottingham, UK
- 2017-21 ■ **Student Ambassador**, *The University of Edinburgh and the University of Nottingham*, Edinburgh and Nottingham, UK
- Resided over the information desk and gave tours of the campus and the School of Physics and Astronomy at the Open Days, Post-offer Visit Days, Visiting Students Welcome Event
- 2018 ● **UUKi Parliamentary Reception for the Go International: Stand Out Campaign**, *Westminster*, London, UK
- Ambassador for The University of Edinburgh

Presentations at International Conferences and Meetings

- 2026 ● **Cosmology Seminar**, *The Institut d'Astrophysique Spatiale*, Orsay-Paris, France, Seminar
- 2026 ● **Cosmology Journal Club**, *University of Padova*, Padova, Italy, Seminar
- 2025 ● **The Fifth National Workshop on the SKA Project - From precursors to SKAO: shaping the future of Italian radio astronomy**, *CNR*, Bologna, Italy, Talk
- 2025 ● **Kaba Kaba: Exploring the first billion years of the Universe**, *Oaks Port Douglas Resort*, Port Douglas, Queensland, Invited talk and part of panel
- 2025 ● **ICRAR-Curtin Colloquium**, *Curtin University*, Perth, Western Australia, Colloquium
- 2025 ● **NAM 2025**, *Durham University*, Durham, UK, Talk and a poster at 2 sessions
- 2025 ● **The galaxy-IGM connection in the first billion years**, *IFPU*, Trieste, Italy, Talk
- 2025 ● **Radio Cosmology and Continuum Observations in the SKA Era: A Synergic View**, *International Centre for Theoretical Sciences*, Bengaluru, India, Talk ([link](#))
- 2024 ● **SKA Cosmology SWG Meeting**, *Observatoire de la Cote d'Azur*, Nice, France, Talk
- 2024 ● **IFPU colloquium**, *IFPU*, Trieste, Italy, Colloquium
- 2024 ● **The First Gigayear(s)**, *Hilo Hawaiian Hotel*, Hilo, Hawai'i, Talk
- 2024 ● **The Origin and Evolution of Supermassive Black Holes**, *Sexten Center for Astrophysics*, Sexten, Italy, Talk ([link 1](#), [link 2](#))
- 2024 ● **Cosmic Dawn at High Latitudes Conference**, *Royal Swedish Academy of Sciences*, Stockholm, Sweden, Talk ([link](#))
- 2024 ● **State of the Universe**, *TIFR*, Mumbai, India, Seminar ([link](#))
- 2024 ● **Cosmology in the Alps Conference**, *Les Diablerets*, Switzerland, Talk ([link](#))
- 2024 ● **Monday Afternoon Talks**, *MIT Kavli Institute*, Cambridge, US, Talk
- 2024 ● **Pune-Mumbai Cosmology and Astro-Particle meeting**, *The Inter-University Centre for Astronomy and Astrophysics*, Pune, India, Talk and Chaired a session ([link](#))
- 2024 ● **Astronomical Society of India meeting**, *IISc*, Bengaluru, India, Talk
- 2024 ● **HEA group meeting**, *Masaryk University*, Brno, Czechia, Seminar
- 2023 ● **Astrophysics Seminar**, *University of Helsinki*, Helsinki, Finland, Seminar
- 2023 ● **Galaxy coffee**, *Max Planck Institute for Astronomy*, Heidelberg, Germany, Talk
- 2023 ● **21-cm Series Seminar**, *University of Cambridge*, Cambridge, UK, Seminar
- 2023 ● **Colloquium**, *National Centre for Radio Astrophysics*, Pune, India, Colloquium
- 2022 ● **Lunch talk**, *The University of Nottingham*, Nottingham, UK, Talk
- 2022 ● **21-cm Series Seminar**, *University of Cambridge*, Cambridge, UK, Seminar

- 2021 ● **State of the Universe**, *TIFR*, Mumbai, India, Seminar ([link](#))
- 2021 ● **NAM 2021**, *The University of Bath*, Bath, UK, Talk
- 2021 ● **SAZERAC 2.0**, Recorded talk ([link](#))
- 2021 ● **Lunch talk**, *The University of Nottingham*, Nottingham, UK, Talk
- 2020 ● **Lunch talk**, *The University of Nottingham*, Nottingham, UK, Talk

Membership in collaborations

- 2024 ● **SKA Cosmology and Epoch of Reionization SWGs**, [link Cosmology](#), [link EoR](#)
- 2024 ● **21-cm Cosmology Group (India)**, [link](#)
- 2023 ● **LSST-DESC, Large scale structure WG**, provisional membership, [link](#)
- 2019 ● **Sherwood-Relics simulation suite**, [link](#)

Training/Skills

- 2023 ● **Foundation HPC-Skills Course**, *DiRAC*
 - 2023 ● **DP0 Virtual Summer School 2023**, *Vera C. Rubin Observatory/LSST*
- Programming Python, Jupyter notebook, C, \LaTeX , Mathematica, IDL, Radiative Transfer, 21cmFAST, IRAF, SExtractor, Large data analysis, MCMC, OpenMP parallelisation, Slurm