

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, *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

Technical and Academic Experience

2025

Refereeing scientific papers, for *A&A*

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", submitted to *MNRAS*, eprint arXiv:2507.11611, 2025. ([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), *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

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

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 Research Community

2023-24

State of the Universe Seminar Series Organizer, *Tata Institute of Fundamental Research*, Mumbai, India



2022	21-cm Series Seminar , <i>University of Cambridge</i> , Cambridge, UK, Seminar
2021	State of the Universe , <i>Tata Institute of Fundamental Research</i> , Mumbai, India, Seminar (link)
2021	National Astronomical Meeting (NAM2021) , <i>The University of Bath</i> , Bath, UK, Talk
2021	SAZERAC 2.0 , Recorded talk (link)
2021	Lunch talk , <i>The University of Nottingham</i> , Nottingham, UK, Talk
2020	Lunch talk , <i>The University of Nottingham</i> , Nottingham, UK, Talk

Training

2023	Foundation HPC-Skills Course , <i>DiRAC</i>
2023	DP0 Virtual Summer School 2023 , <i>Vera C. Rubin Observatory/LSST</i>

Skills

Programming	Python, Jupyter notebook, C, \LaTeX , Mathematica, basic in IDL
	Radiative Transfer, 21cmFAST, IRAF, SExtractor
	Large data analysis (binary and HDF5 formats), MCMC, OpenMP parallelisation, Slurm