

# Yves Kini

*PhD candidate*

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## Research interests

- High energy astrophysics: neutron stars, neutron star atmospheres, type-I X-ray bursts, burst oscillations
- Nuclear physics: equation of state of cold ultra-dense neutron matter
- High energy physics: neutrino phenomenology and theory, beyond the standard model phenomenology
- Computational (astro)physics: machine learning, high-performance computing & parallelization, Bayesian inference, nested sampling, Monte Carlo methods.

## Education

2020 –  
onward **PhD Candidate.**

Anton Pannekoek Institute of Astronomy, University of Amsterdam

Topic: Pulse Profile Modeling of Thermonuclear Burst Oscillations

Advisors: Prof. Anna L. Watts, Dr. Phil Uttley

2019 **Msc in Physics.**

University of Ouagadougou

Topic: Radio astronomy: Allocation and coexistence of radio frequency bands in Burkina Faso

Advisors: Prof. Jean Koulidiati, Dr Sié Zacharie Kam

2015 **Air Traffic Control degree.**

Ecole Africaine de Meteorologie et de l'Aviation Civile

Speciality: Tower and Approach

2019 **BSc in Physics.**

University of Ouagadougou

## Awards & Scholarships

2021 **Augustus Prince Scholar Award.**

Description: Award sponsored by Brookhaven National Laboratory's African American Advancement Group

2011 – 2013 **National Scholarship.**

Description: Governmental monthly stipend provided to the best students in Burkina Faso

2013 **Amici Di Pietro Annigoni Scholarship.**

Description: Award of about 600 USD provided by the Italian NGO Amici Di Pietro Annigoni to 10 of the undergraduate students in Burkina Faso

2009 **Award of best student 2009.**

Description: Award of 'Le Groupe Essor' to reward the best high school students in Cote d'Ivoire

2008 **Award of merit, excellence of the best student 2008.**

Description: Award of 'Le Conseil National de la Jeunesse de Cote d'Ivoire' to reward the high school best students in Cote d'Ivoire

## Scientific presentations & seminars

06/2023 **Pulse profile modeling of thermonuclear burst oscillations.**

Workshop talk, Neutron Rich Matter on Heaven and Earth, Institute for Nuclear Theory, Seattle, US, Hosts: Katerina Chatziioannou, Jorge Piekarewicz & Anna Watts

08/2021 **Tau neutrino cross sections at Ultra-high-energy.**

Award talk, Brookhaven National Laboratory, Upton, New York, US, Hosts: African American Advancement Group

11/2020 **Ultra-high-energy Tau neutrino cross sections with GRAND and POEMMA.**

African School of Physics (ASP) online seminars, Host: Ketevi Assamagan

## Administrative duties, teaching experience & public outreach

2023 **Daily supervisor for B.Sc. thesis project of Guru Partap Khalsa, University of Amsterdam.**

Project title: Thermonuclear burst oscillations: Effects of ignoring phase drift in pulse profile modelling

2023 Outreach about astronomy throughout the year including dome tours, star-gazing events, kids events, etc.

2022 Member of the institute Ph.D. & postdoc council

2022 Teaching Assistant, Open Problems in Modern Astrophysics, University of Amsterdam

2021 Teaching Assistant, Extreme Astrophysics, University of Amsterdam

2020 Teaching Assistant, Extreme Astrophysics, University of Amsterdam

## Technical skills

Coding & Tools Python, C++,  $\LaTeX$ , bash, git, html, css

Telescope operation 51cm and 40cm optical telescope at Anton Pannekoek Observatory

## Grants on the Dutch National Supercomputer (as PI)

2022 **EINF-5862: Inferring super-burster 4U-1636 properties with Pulse Profile Modelling.**

Description: Small NWO allocation of 1 million CPU hours for computing time

2021 **EINF-3731: X-PSI parameter estimation code calibration for thermonuclear burst sources.**

Description: Small NWO allocation of 1 million CPU hours for computing time

## Publications

8. **Pulse profile modelling of thermonuclear burst oscillations II: handling variability.**

**Yves Kini**, Tuomo Salmi, Serena Vinciguerra, Anna L. Watts, Devarshi Choudhury, Slavko Bogdanov, Johannes Buchner, Zach Meisel, Valery Suleimanov. *Submitted to MNRAS*

<https://doi.org/10.48550/arXiv.2308.12895>

7. **An updated mass-radius analysis of the 2017-2018 NICER data set of PSR J0030+0451.**

Serena Vinciguerra, Tuomo Salmi, Anna L. Watts, Devarshi Choudhury, Thomas E. Riley, Paul S. Ray, Slavko Bogdanov, **Yves Kini**, Sebastien Guillot, Deepto Chakrabarty, Wynn C. G. Ho, Daniela Huppenkothen, Sharon M. Morsink, Zorawar Wadiasingh. *Accepted for publication in ApJ*

<https://doi.org/10.48550/arXiv.2308.09469>

6. **X-PSI parameter recovery for temperature map configurations inspired by PSR J0030+0451.**

Serena Vinciguerra, Tuomo Salmi, Anna L. Watts, Devarshi Choudhury, **Yves Kini**, Thomas E. Riley. *Accepted for publication in ApJ*

<https://doi.org/10.48550/arXiv.2308.08409>

5. **Atmospheric effects on neutron star parameter constraints with NICER.**

Tuomo Salmi, Serena Vinciguerra, Devarshi Choudhury, Anna L. Watts, Wynn C. G. Ho, Sebastien Guillot, **Yves Kini**, Bas Dorsman, Sharon M. Morsink, Slavko Bogdanov. *Accepted for publication in ApJ*

<https://doi.org/10.48550/arXiv.2308.09319>

4. **Pulse profile modelling of thermonuclear burst oscillations I. The effect of neglecting variability .**

**Yves Kini**, Tuomo Salmi, Anna L Watts, Serena Vinciguerra, Devarshi Choudhury, Siem Fenne, Slavko Bogdanov, Zach Meisel, Valery Suleimanov. *MNRAS*, V.522, I. 3, Jul. 2023

<https://doi.org/10.1093/mnras/stad1030>

3. **X-PSI: A Python package for neutron star X-ray pulse simulation and inference.**

Thomas E. Riley, Devarshi Choudhury, Tuomo Salmi, Serena Vinciguerra, **Yves Kini**, Bas Dorsman, Anna L. Watts, Daniela Huppenkothen, and Sebastien Guillot

<https://doi.org/10.21105/joss.04977>

2. **Bhjet: a public multizone, steady state jet+ thermal corona spectral model.**

M Lucchini, C Ceccobello, S Markoff, **Y Kini**, A Chhotray, RMT Connors, P Crumley, H Falcke, D Kantzas, D Maitra. *MNRAS*, V.517, I. 4, Dec. 2022

<https://doi.org/10.1093/mnras/stac2904>

1. **Ultrahigh-energy tau neutrino cross sections with GRAND and POEMMA.**

Peter B. Denton and **Yves Kini**. *Phys. Rev. D* 102, 123019

<https://doi.org/10.1103/PhysRevD.102.123019>

## Papers in preparation

1. **Pulse profile modeling of thermonuclear burst oscillations III : constraining the properties of XTE J1814-338.**

**Yves Kini** et al., To be submitted to MNRAS.

2. **Pulse profile modelling of thermonuclear superburst oscillations from 4U 1636-536.**

**Yves Kini** et al., To be submitted to MNRAS.

## Work experience

2015 – 2020 **Air traffic controller.**

Qualifications: Tower & Approach

Description: Monitoring and regulating ground and air traffic. Providing information to pilots. Alerting response teams of safety concerns or emergencies

## Workshops attended

2019 **Advancing Theoretical Astrophysics Summer School, Amsterdam, Netherlands.**

Topic covered: Theoretical astrophysics

Comment: This workshop led to an extended collaboration with Prof. Sera Markoff's group and to a research visit

2018 **African School of Fundamental Physics and Applications, Windhoek, Namibia.**

Topic covered: Nuclear and Particle Physics; Astrophysics and Cosmology, Accelerators; Radiation and Medical Physics, Materials Physics; Renewable Energies and Energy Efficiency

Comment: This workshop led to a three-month research visit at Brookhaven National Laboratory and a collaboration with Dr. Mary Bishai and Dr. Peter B. Denton

2017 **West African International Summer School for Young Astronomers Accra, Ghana.**

Topic covered: Radio astronomy