

Sudarshan Neopane

Email: sneopane@vols.utk.edu

RESEARCH INTEREST

- **Theoretical and Computational Astrophysics**

EDUCATION

- **University of Tennessee Knoxville** Knoxville, TN
Ph.D. in Physics; GPA: 4.00/4.00 Aug 2021 - Current
- **University of Massachusetts Dartmouth** North Dartmouth, MA
M.S. in Physics; GPA: 4.00/4.00 Sep 2019 - Current
- **St. Xavier's College (Affiliated to Tribhuvan University)** Kathmandu, Nepal
B.Sc. in Physics; Percentage: 83.55 % Dec 2014 - Sep 2018

PUBLICATIONS

- **Near-Chandrasekhar-Mass Type Ia Supernovae from the Double-Degenerate Channel**
S Neopane, K Bhargava, R Fisher, M Ferrari, S Yoshida, S Toonen (Accepted for publication to the Astrophysical Journal; [preprint available](#))
- **First-Principles study of Van Der Waals Interactions between Halogen Molecules (Cl_2 and I_2)**
S Neopane, N Pantha, *JNPS*, **5**(1), 19-23 (2019). (Published in [Journal of Nepal Physical Society](#))

RESEARCH PROJECTS

- **Near-Chandrasekhar mass progenitor from the white dwarf mergers:** I carried out an analytical investigation of the accretion mechanism during white dwarf mergers, showing that near-Chandrasekhar mass progenitors are primarily formed through the double-degenerate channel. The analytical work preceded multi-dimensional hydrodynamical simulations of merger products of two white dwarfs. The outputs from the simulations were processed to obtain nucleosynthetic yields and synthetic spectra.
- **Van der Waals interactions between halogen atoms/molecules:** I investigated van der Waals interaction using density functional theory by taking halogen atoms/molecules as model systems. I calculated the effect of van der Waals interaction on equilibrium separation and binding energies of the model systems.

SKILLS SUMMARY

- **Languages:** Fortran, C, Python, Matlab, Bash
- **Simulation Tools:** FLASH, Torch, Quantum ESPRESSO
- **Visualization:** yt, Xcrysden
- **HPC Skills:** MPI, Open MP
- **HPC Systems:** Summit(ORNL), Stampede2 (TACC), Carnie (UMass Dartmouth)

TEACHING AND RESEARCH EXPERIENCE

- **University of Tennessee Knoxville**
Teaching Assistant (*PHY 231: Electricity and Magnetism*) Aug 2021 - Current
- **University of Massachusetts Dartmouth**
Research Assistant (*Supervisor: Robert Fisher*) Jan 2021 - July 2021
Head Teaching Assistant (*PHY 113: Mechanics*) Sep 2020 - Dec 2020
Instructor (*PHY 114: Electricity and Magnetism*) Jul 2020 - Aug 2020
Teaching Assistant (*PHY 113: Mechanics*) Sep 2019 - May 2020

HONORS AND AWARDS

- Academic Excellence Award, St. Xavier's College, Kathmandu, Nepal 2018
- Golden Jubilee Scholarship, Embassy of India, Kathmandu, Nepal 2015 - 2018

WORKSHOPS AND PRESENTATIONS

- Talk for 237th AAS meeting, 13 January, 2021
Title-**Near-Chandrasekhar Mass Type Ia Supernovae from the Double-Degenerate Channel**
- Contributed talks for 237th AAS meeting, 15 January, 2021
Title-**Multidimensional Hydrodynamical Simulations of the Near-Chandrasekhar Mass SN Ia SNR 3C 397**
Title-**Classification of Synthetic Spectra of Hydrodynamical Models of 3C 397**
- XSEDE HPC Workshop: Summer Boot Camp, 2-5 June, 2020 (Online)
- Flatiron Institute 2020 yAC: yt Virtual Workshop, 23-25 March, 2020 (Online)
- Poster presentation titled "**Preliminary results of van der Waals interactions in halogen molecules**" at ICTP Physics Without Frontier winter school, 6 January, 2018 (Kathmandu, Nepal)

VOLUNTEERED ACTIVITIES

- Member of the editorial board of St. Xavier's Physics department publication, "**New Dimension**" from Nov 2016-Sep 2018.
- Volunteered at events organized by St. Xavier's Physics Council (SXPC).
- Monitored and volunteered events organized by Sodalitas de' Mathematica.