Vsevolod Nedora

Am Mühlenberg 1
114476 Potsdam
Germany
+49 15224239433
vsevolod.nedora@gmail.com

Experience

2021– **Postdoctoral researcher in Computational Astrophysics**.
Multi-messenger Astrophysics of Compact Binaries Group
Department of Computational Relativistic Astrophysics
Max Planck Institute for Gravitational Physics, Potsdam, Germany
SUPERVISOR: Prof. Tim Dietrich, Prof. Masaru Shibata

- First study to investigate the effect of thermal electron population in kilonova afterglow modeling [1, 2].
- Contribution to the modelling and analysis of multiple γ-ray bursts (GRBs) using nuclear-physics and multi-messenger astrophysics (NMMA) multi-messenger Bayesian inference framework [3, 4, 5].

2019–2021 **PhD student in Theoretical Physics**.
Numerical Relativity Group
Theoretisch-Physikalisches Institute, Jena, Germany
SUPERVISOR: Prof. Sebastiano Bernuzzi

- First study to link the dynamical instabilities in the binary neutron star (BNS) merger remnant to massive outflow and blue component of the kilonova AT2017gfo [6].
- First study showing that the observed change in the GRB170817A can be explained by the non-thermal kilonova afterglow from targeted numerical relativity (NR) simulations [7, 8].
- Comprehensive study of the largest set of NR simulations with neutrino effects and subgrid turbulence, targeted to GW170817 [6, 9, 10].
- Comprehensive statistical study of the ejecta properties of the largest-to-date, compiled dataset of NR BNS models [11].
- Development of the synchrotron afterglow code `PyBlastAfterglow` to model GRB and ejecta afterglows [7].

2014–2017 **Undergraduate Research Fellow**.
Radioastronomy group
Pushchino Radio Astronomy Observatory, Moscow, Russia
SUPERVISOR: Prof. Vadim Artyukh

- Development of the numerical model of the active galactic nuclei (AGN) as a non-uniform synchrotron-emitting spherical source [13].

Education

2018–2022 **PhD in Theoretical Physics**.
Theoretisch-Physikalisches Institute, Jena Germany

SUPERVISOR	Prof. Sebastiano Bernuzzi, sebastiano.bernuzzi@uni-jena.de
THESIS TITLE	Simulations of Binary Neutron Star Mergers: Mass Ejection and Electromagnetic Counterparts
GRADUATION	14.04.2022
GRADE	Magna cum laude

2016–2018 **Master's degree in Astrophysics**.
Argerlander Institute for Astronomy, Bonn Germany

SUPERVISOR	Prof. Norbert Langer, nlanger@astro.uni-bonn.de Dr. Luca Grassitelli, luca@astro.uni-bonn.de
THESIS TITLE	Investigating the physical conditions at the base of the stellar wind of the massive helium stars. Applications for the mass loss rate constrains
GRADUATION	September 2018
GRADE	2.0/1.0 good

2010–2015 **Bachelor's degree in Physics**.
Far-Eastern Federal University, Vladivostok Russia

Supervisor	Prof. Vadim S. Artyukh, art@prao.ru
Thesis title	Research of synchrotron emission of a simple spherical radio source
Graduation	July 2015
Grade	5/5 excellent

Scholarships

2011-2015 **Highest academic scholarship**, (FEFU).

Publications

[1] **V. Nedora**, Tim Dietrich, Masaru Shibata, Martin Pohl, and Ludovica Crosato Menegazzi. Modeling kilonova afterglows: Effects of the thermal electron population and interaction with GRB outflows. *Mon. Not. Roy. Astron. Soc.*, 8 2022. arXiv:2208.01558.

[2] **V. Nedora**, Tim Dietrich, and Masaru Shibata. Synthetic radio images of structured GRB and kilonova afterglows. 2 2023. arXiv:2302.12850.

[3] Nina Kunert, Sarah Antier, **V. Nedora**, Mattia Bulla, Peter T. H. Pang, Shreya Anand, Michael Coughlin, Ingo Tews, Jennifer Barnes, Meili Pilloix, Weizmann Kiendrebeogo, and Tim Dietrich. Model selection for GRB 211211A through multi-wavelength analyses. January 2023. arXiv:2301.02049.

[4] Peter T. H. Pang, Tim Dietrich, Michael W. Coughlin, Mattia Bulla, Ingo Tews, Mouza Almualla, Tyler Barna, Weizmann Kiendrebeogo, Nina Kunert, Gargi Mansingh, Brandon Reed, Niharika Sravan, Andrew Toivonen, Sarah Antier, Robert O. VandenBerg, Jack Heinzel, **V. Nedora**, Pouyan Salehi, Ritwik Sharma, Rahul Somasundaram, and Chris Van Den Broeck. NMMA: A nuclear-physics and multi-messenger astrophysics framework to analyze binary neutron star mergers. may 2022. arXiv:2205.08513.

[5] D. A. Kann, S. Agayeva, V. Aivazyan, S. Alishov, C. M. Andrade, S. Antier, A. Baransky, P. Bendjoya, Z. Benkhaldoun, S. Beradze, D. Berezin, M. Boër, E. Broens, S. Brunier, M. Bulla, O. Burkhonov, E. Burns, Y. Chen, Y. P. Chen, M. Conti, M. W. Coughlin, W. W. Cui, F. Daigne, B. Delaveau, H. A. R. Devillepoix, T. Dietrich, D. Dornic, F. Dubois, J. G. Ducoin, E. Durand, P. A. Duverne, H. B. Eggenstein, S. Ehgamberdiev, A. Fouad, M. Freeberg, D. Froebrich, M. Y. Ge, S. Gervasoni, V. Godunova, P. Gokuldass, E. Gurbanov, D. W. Han, E. Hasanov, P. Hello, T. Hussenot-Desenonges, R. Inasaridze, A. Iskandar, N. Ismailov, A. Janati, T. Jegou du Laz, S. M. Jia, S. Karpov, A. Kaeouach, R. W. Kiendrebeogo, A. Klotz, R. Kneip, N. Kochiashvili, N. Kunert, A. Lekic, S. Leonini, C. K. Li, W. Li, X. B. Li, J. Y. Liao, L. Logie, F. J. Lu, J. Mao, D. Marchais, R. Ménard, D. Morris, R. Natsvlishvili, **V. Nedora**, K. Noonan, K. Noysena, N. B. Orange, P. T. H. Pang, H. W. Peng, C. Pellouin, J. Peloton, T. Pradier, O. Pyshna, Y. Rajabo, S. Rau, C. Rinner, J. P. Rivet, F. D. Romanov, P. Rosi, V. A. Rupchandani, M. Serrau, A. Shokry, A. Simon, K. Smith, O. Sokoliuk, M. Soliman, L. M. Song, A. Takey, Y. Tillayev, L. M. Tinjaca Ramirez, I. Tosta e Melo, D. Turpin, A. de Ugarte Postigo, S. Vanaverbeke, V. Vasylenko, D. Vernet, Z. Vidadi, C. Wang, J. Wang, L. T. Wang, X. F. Wang, Shaolin L. Xiong, Y. P. Xu, W. C. Xue, X. Zeng, S. N. Zhang, H. S. Zhao, and X. F. Zhao. GRANDMA and HXMT Observations of GRB 221009A – the Standard-Luminosity Afterglow of a Hyper-Luminous Gamma-Ray Burst. February 2023. arXiv:2302.06225.

[6] **V. Nedora**, S. Bernuzzi, D. Radice, A. Perego, A. Endrizzi, and N. Ortiz. Spiral-wave wind for the blue kilonova. *Astrophys. J.*, 886(2):L30, 2019. arXiv:1907.04872.

[7] **V. Nedora**, David Radice, Sebastiano Bernuzzi, Albino Perego, Boris Daszuta, Andrea Endrizzi, Aviral Prakash, and Federico Schianchi. Dynamical ejecta synchrotron emission as possible contributor to the rebrightening of GRB170817A. *Mon. Not. Roy. Astron. Soc.*, 506(4):5908–5915, 4 2021. arXiv:2104.04537.

[8] A. Hajela, R. Margutti, J. S. Bright, K. D. Alexander, B. D. Metzger, **V. Nedora**, A. Kathirgamaraju, B. Margalit, D. Radice, E. Berger, A. MacFadyen, D. Giannios, R. Chornock, I. Heywood, L. Sironi, O. Gottlieb, D. Coppejans, T. Laskar, Y. Cendes, R. Barniol Duran, T. Eftekhari, W. Fong, A. McDowell, M. Nicholl, X. Xie, J. Zrake, S. Bernuzzi, F. S. Broekgaarden, C. D. Kilpatrick, G. Terreran, V. A. Villar, P. K. Blanchard, S. Gomez, G. Hosseinzadeh, D. J. Matthews, and J. C. Rastinejad. The emergence of a new source of X-rays from the binary neutron star merger GW170817. Apr. 2021. arXiv:2104.02070.

[9] S. Bernuzzi, M. Breschi, B. Daszuta, A. Endrizzi, D. Logoteta, **V. Nedora**, A. Perego, D. Radice, F. Schianchi, F. Zappa, I. Bombaci, and N. Ortiz. Accretion-induced prompt black hole formation in asymmetric neutron star mergers, dynamical ejecta and kilonova signals. *Mon. Not. Roy. Astron. Soc.*, June 2020. arXiv:2003.06015.

[10] **V. Nedora**, S. Bernuzzi, D. Radice, B. Daszuta, A. Endrizzi, A. Perego, A. Prakash, M. Safarzadeh, F. Schianchi, and D. Logoteta. Numerical Relativity Simulations of the Neutron Star Merger GW170817: Long-Term Remnant Evolutions, Winds, Remnant Disks, and Nucleosynthesis. *Astrophys. J.*, 906(2):98, 2021. arXiv:2008.04333.

[11] **V. Nedora**, F. Schianchi, S. Bernuzzi, D. Radice, B. Daszuta, A. Endrizzi, A. Perego, A. Prakash, and F. Zappa. Mapping dynamical ejecta and disk masses from numerical relativity simulations of neutron star mergers. 11 2020. arXiv:2011.11110.

[12] Aviral Prakash, David Radice, Domenico Logoteta, Albino Perego, **V. Nedora**, Ignazio Bombaci, Rahul Kashyap, Sebastiano Bernuzzi, and Andrea Endrizzi. Signatures of deconfined quark phases in binary neutron star mergers. *Phys. Rev. D*, 104(8):083029, 2021. arXiv:2106.07885.

[13] V. Artyukh and **V. Nedora**. Effects of nonuniformity of the radio source on estimates of their physical parameters. *Astrofizika*, 60(3):337–349, Sept. 2017. 10.1007/s10511-017-9485-6.

Observations

- Licence to operate Argelander Institute for Astronomy 50cm Telescope,
  Experience with telescope operation, image post-processing, source extraction

Seminars and Talks

1. *Modeling kilonova afterglows: Effects of the thermal electron population and interaction with GRB outflows*
   DPG conference, Bad Honnef, Germany, November 2022
2. *Towards combined modelling of GRB and Kilonova afterglows*
   PFAROS conference, Rome, Rome, May 2022
3. *Towards combined modelling of GRB and Kilonova afterglows*
   DPG meeting, Online, Germany, March 2022
4. *IAU Symposium 363* December 1 2021 (attendance only, online)
5. *Binary neutron star mergers: ejecta, nucleosynthesis and electromagnetic counterparts*
   RTG conference, Online (Jena), Germany, September 2021
6. *BNS mergers: EM counterparts & nucleosynthesis* (poster)
   ISAPP PhD school Summer School on Gravitational Waves, *online*, June, 2021
7. *Spiral-wave wind for the blue kilonova*
   MICRA workshop at TPI, Jena, Germnay August 2019
8. *Neutron Star Mergers & Electromagnetic Counterparts*
   ECT* conference plenary talk at University of Trento, Trento, Italy June 2019
9. *Numerical Relativity Informed Kilonova Model*
   RTG conference, Munich, Germnay, March 2019

Teaching

- Tutor at Bonn University for subjects: *Stars and Stellar Evolution* and *Nucleosynthesis*, 2017-2018
- Lecturer and tutot at FSU Jena for courses: *Computational Physics II* and *Project Practicum: Numerical solutions to wave equation*, 2019-2021

Memberships

- German Physical Society (since 2019)
- Computational Relativity Group (since 2019)

Service and outreach

- Part of the local organizing committee for MICRA workshop at jena in August 2019
- Computational relativity group (CoRe) (June 2019 – Present)
  Maintained and updated the web-page and mailing lists
- Scientific posters (October 2018 – Present)
  Prepared several posters for conferences advertisement and young scientists