Kalina V. Nedkova

Website | GitHub | ADS Publications

Location: Baltimore, MD, USA
Email: knedkov1@jhu.edu

Postdoctoral Researcher at Johns Hopkins University

Research interests include the formation and evolution of galaxies; multi-wavelength imaging; spectroscopy; galaxy modeling and statistics; galaxy scaling relations; galaxy morphology including decomposition into bulge and disk components

Education

Tufts University 2017 – 2022
Doctor of Philosophy in Physics
Thesis: *The Evolution of the Stellar Mass–Size Relations of Galaxies and Their Main Components*
Advisor: Danilo Marchesini

Tufts University 2015 – 2017
Master of Science in Physics

University of Massachusetts, Amherst 2011 – 2015
Bachelor of Science in Physics, Minors in Mathematics and Computer Science

Research Experience

Postdoctoral Researcher 2022 – Present
Johns Hopkins University
Mentor & Supervisor: Marc Rafelski

- Determined the gas phase metallicities of galaxies from PASSAGE (PI:M. Malkan)
- Measured the rest-frame ultraviolet size evolution of disk galaxies to understand when and where star-formation in galaxies occurs
- Studied dust distributions within simulated star-forming galaxies to explore the effects of dust attenuation on galaxy light profiles and sizes
- Awarded HST Director's Discretionary Research Fund (DDRF) in Spring 2023 to study the role of galaxy morphology in the mass–metallicity–star-formation rate relation

Research Assistant 2016 – 2022
Tufts University
Advisor: Danilo Marchesini

- Decomposed galaxies into components to measure the mass – size relation of disks and bulges individually
- Measured the mass – size relation of galaxies in the Hubble Frontier Fields, extending this relation to lower mass galaxies than previous possible at high redshift
- Measured the luminosity function of galaxies using deep surveys
- Reprocessed all G104 and G141 HST-WFC3 grism data on the archive at the time with GRIZLI and created a quality flag associated to the grism redshifts extracted by GRIZLI
- Co-supervised a third-year undergraduate student (2017)

Extended Scientific Visitor at ESO, Chile May – June 2018 and January – August 2019
Advisor: Boris Häußler

- Learned to use GALAPAGOS-2 and GALFITM codes to measure galaxy morphological properties and to decompose galaxies into their main components.

Selected Publications

A full publication list can be found on ADS.
First Author Publications:

2024, submitted UVCANDELS: The role of dust on the stellar mass–size relation of disk galaxies at $0.5 \leq z \leq 3.0$, ***K. V. Nedkova***, *M. Rafelski, H. I. Teplitz, V. Mehta, L. DeGroot, S. Ravindranath, A. Alavi et al.*, ApJ

2024, submitted Bulge+disc decomposition of HFF and CANDELS galaxies: UVJ diagrams and stellar mass–size relations of galaxy components at $0.2 \leq z \leq 1.5$, ***K. V. Nedkova***, *B. Häußler, D. Marchesini, et al.*, MNRAS

2021 Extending the evolution of the stellar mass-size relation at $z \leq 2$ to low stellar mass galaxies from HFF and CANDELS, ***K. V. Nedkova***, *B. Häußler, D. Marchesini, P. Dimauro, G. Brammer, et al.*, MNRAS

Contributing Author Publications (Excluding LIGO collaboration):

2024 The MUSE Ultra Deep Field (MUDF). V. Characterizing the Mass-Metallicity Relation for Low Mass Galaxies at $z \sim 1-2$, *M. Revalski, M. Rafelski, A. Henry, M. Fossati, et al.* ***including K. V. Nedkova***, ApJ

BUDDI-MaNGA III: The mass-assembly histories of bulges and discs of spiral galaxies, *K. Jegatheesan, E. J. Johnston, B. Häußler,* ***K. V. Nedkova***, A&A

Stellar Half-mass Radii of $0.5 < z < 2.3$ Galaxies: Comparison with JWST/NIRCam Half-light Radii, *A. van der Wel, M. Martorano, B. Häußler,* ***K. V. Nedkova****, T. B. Miller, G. B. Brammer, et al.*, ApJ

2023 UV-bright Star-forming Clumps and Their Host Galaxies in UVCANDELS at $0.5 \leq z \leq 1$, *A. Martin, Y. Guo, X. Wang, A. M. Koekemoer, M. Rafelski, H. I. Teplitz, et al.* ***including K. V. Nedkova***, ApJ

The MUSE Ultra Deep Field (MUDF). III. Hubble Space Telescope WFC3 Grism Spectroscopy and Imaging, *M. Revalski, M. Rafelski, M. Fumagalli, M. Fossati, et al.* ***including K. V. Nedkova***, ApJS

2022 Resolved Stellar Mass Maps of Galaxies in the Hubble Frontier Fields: Evidence for Mass Dependency in Environmental Quenching, *V. Y. Y. Tan, A. Muzzin, Z. C. Marsan, et al.* ***including K. V. Nedkova***, ApJ

2018 Spatially Extended Low-ionization Emission Regions (LIERs) at $z \sim 0.9$, *R. E. Hviding, G. B. Brammer, I. B. Momcheva, B. F. Lundgren, D. Marchesini, N. Pirzkal, R. E. Ryan et al.* ***including K. V. Nedkova***, ApJ

HFF-DeepSpace Photometric Catalogs of the 12 Hubble Frontier Fields, Clusters, and Parallels: Photometry, Photometric Redshifts, and Stellar Masses, *H. V. Shipley, D. Lange-Vagle, D. Marchesini, G. B. Brammer, L. Ferrarese, M. Stefanon, E. Kado-Fong, et al.* ***including K. V. Nedkova***, ApJS

Accepted Observing Proposals

JWST Cycle 3 : POPPIES: The Public Observation Pure Parallel Infrared Emission-Line Survey (**PIs**: J. Kartaltepe & M. Rafelski, including **Co-I K. V. Nedkova)**

HST Cycle 31 : Unlocking the rich potential of JWST slitless spectroscopy with the help of HST: an optical follow-up campaign (**PI**: V. Mehta, including **Co-I K. V. Nedkova)**

Technical Skills

Languages : Python, IDL

Astronomy Tools : GALAPAGOS and GalfitM – Multi-wavelength galaxy light profile fitting software

GRIZLI – a Grism redshift and line analysis software for space-based slitless spectroscopy

FAST – a code that fits stellar population synthesis templates

EAZY – a photometric redshift code

Teaching Experience

Instructor (2021) : Astronomy 16: Special Topics - Astrophysics Lab, a computational course to explore and solve common astrophysical problems at Tufts University

Teaching Asst. (2015-2022) : Classical Mechanics Lab, E&M Lab, Lead for 'Teaching for TAs', Electricity and Magnetism Recitations Introduction to Astronomy, Galactic and Extragalactic Astrophysics

Talks and Seminars

2024 Science with the Hubble and James Webb Space Telescopes VII: Stars, Gas & Dust in the Universe, Porto, Portugal

Space Telescope Science Institute Spring Symposium: "Recipes to Regulate Star Formation at All Scales: From the Nearby Universe to the First Galaxies", STScI (poster)

AAS Winter Conference in New Orleans, LA

2023 First Year of JWST Science Conference, STScI

EAS Annual Meeting in Krakow, Poland

	AAS Winter Conference in Seattle, WA
2022	Wine and Cheese Seminar Series at Johns Hopkins University
	Earth & Space Reports YouTube Series
	"What Physicists Do." Public Lecture Series at Sonoma State University
	Galaxy Cluster Group Meeting, CfA
2021	Boston University Graduate Student Seminar
	Tufts Astronomy Seminar
2019	Thirty Minute Talk Series, ESO, Santiago, Chile
	The Life and Death of Star-Forming Galaxies, ICRAR
2018	Thirty Minute Talk Series, ESO, Santiago, Chile

Outreach

2024	Served on the Local Organizing Committee for the 2024 STScI Spring Symposium
	Served on the Gender Diversity in Physics Panel at Tufts University
2019 – 2021	Served on the Natural Sciences & Engineering Committee for the Graduate Student Research Competition at Tufts University
2018	Helped High School students in Somerville, MA choose and develop science fair projects

Awards, Honors, and Fellowships

2021 – 2022	John F. Burlingame Graduate Fellowship in Physics, Tufts University (1 year of funding)
Summer 2021	Graduate Research Excellence At Tufts (GREAT) Fellowship, Tufts University ($500)
2020 – 2021	Katherine A. McCarthy Graduate Fellowship in Physics, Tufts University (1 year of funding)
2018	Graduate Student Research Competition Award, Tufts University ($1000)
2016	Special Breakthrough Prize in Fundamental Physics, for contributing to the detection of gravitational waves