

Kalina V. Nedkova

[Website](#) | [GitHub](#) | [ADS Publications](#)

Location: Baltimore, MD, USA

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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; the evolution of chemical abundances in galaxies; galaxy morphology including decomposition into bulge and disk components

EDUCATION

Tufts University <i>Doctor of Philosophy in Physics</i> Thesis: <i>The Evolution of the Stellar Mass–Size Relations of Galaxies and Their Main Components</i> Advisor: Danilo Marchesini	2017 – 2022 Awarded August 2022
Tufts University <i>Master of Science in Physics</i>	2015 – 2017 Awarded May 2017
University of Massachusetts, Amherst <i>Bachelor of Science in Physics, Cum Laude and Honors, Minors in Mathematics and Computer Science</i>	2011 – 2015 Awarded May 2015

RESEARCH EXPERIENCE

Postdoctoral Researcher at Johns Hopkins University Supervisor: Marc Rafelski	2022 – Present
<ul style="list-style-type: none">Measured the rest-frame ultraviolet size evolution of disk galaxies, revealing that massive galaxies tend to be significantly larger in the rest-frame UV than rest-frame optical at $0 \leq z \leq 3$Studied spatial dust distributions within simulated star-forming galaxies to explore the effects of centrally concentrated dust attenuation on galaxy light profiles and sizesAdapted and developed software suite to measure emission lines from JWST grism data [GitHub Repository]Determining the gas phase metallicities of galaxies from PASSAGE, a Cycle 1 JWST Program (PID: 1571; PI: M. Malkan)Major contributions to HST Director’s Discretionary Research Fund (DDRF) proposal in Spring 2023 to study the role of galaxy morphology in the mass–metallicity–star-formation rate relationMajor contributions to POPPIES, a large pure-parallel Cycle 4 JWST proposal	
Research Assistant at Tufts University Advisor: Danilo Marchesini	2016 – 2022
<ul style="list-style-type: none">Decomposed galaxies into components to measure the mass – size relation of disks and bulges individuallyMeasured the mass – size relation of galaxies in the Hubble Frontier Fields, extending this relation to lower mass galaxies than previous possible at high redshiftMeasured the luminosity function of galaxies using deep surveysReprocessed all G104 and G141 HST-WFC3 grism data on the archive at the time with the GRIZLI software and created quality flags associated with the grism redshifts extracted by GRIZLICo-supervised a third-year undergraduate student (2017)	
Extended Scientific Visitor at ESO, Chile Advisor: Boris Häußler	May – June 2018 and January – August 2019
<ul style="list-style-type: none">Learned to use GALAPAGOS-2 and GALFITM codes to measure galaxy morphological properties and to decompose galaxies into their main components.	

SELECTED PUBLICATIONS

49 published papers, with an H-index of 33. A full publication list can be found on [ADS](#).

First Author Publications:

- 2024** K. V. Nedkova, B. Häußler, D. Marchesini, et al., *Bulge+disc decomposition of HFF and CANDELS galaxies: UVJ diagrams and stellar mass–size relations of galaxy components at $0.2 \leq z \leq 1.5$* , *MNRAS*, **532**, 3747
K. V. Nedkova, M. Rafelski, H. I. Teplitz, V. Mehta, L. DeGroot, S. Ravindranath, A. Alavi, A. Beckett, N. A. Grogin, et al., *UVCANDELS: The Role of Dust on the Stellar Mass–Size Relation of Disk Galaxies at $0.5 \leq z \leq 3.0$* , *ApJ*, **970**, 188
- 2021** K. V. Nedkova, B. Häußler, D. Marchesini, P. Dimauro, G. Brammer, P. Eigenthaler, et al., *Extending the evolution of the stellar mass–size relation at $z \leq 2$ to low stellar mass galaxies from HFF and CANDELS*, *MNRAS*, **506**, 928

Publications with Significant Contribution:

- 2024** K. Jegatheesan, E. J. Johnston, B. Häußler, K. V. Nedkova, *BUDDI-MaNGA III: The mass-assembly histories of bulges and discs of spiral galaxies*, *A&A*, **684**, 32
A. van der Wel, M. Martorano, B. Häußler, K. V. Nedkova, T. B. Miller, G. B. Brammer, G. van de Ven, J. Leja, et al., *Stellar Half-Mass Radii of $0.5 < z < 2.3$ Galaxies: Comparison with JWST/NIRCam Half-light Radii*, *ApJ*, **960**, 53

Contributing Author Publications (Excluding LIGO Publications):

- 2024** A. Morales, S. Finkelstein, M. Bagley, A. Alavi, N. Grogin, N. Hathi, A. Koekemoer, K. V. Nedkova, L. Prichard, M. Rafelski, B. Sunnquist, et al., *Galaxy Rest-Frame UV Colors at $z \sim 2-4$ with HST UVCANDELS*, *ApJ*, submitted
V. Mehta, M. Rafelski, B. Sunnquist, H. I. Teplitz, C. Scarlata, X. Wang, A. Fontana, et al. including K. V. Nedkova, *UVCANDELS: Catalogs of photometric redshifts and galaxy physical properties*, *ApJS*, **275**, 17
A. Beckett, M. Rafelski, M. Revalski, M. Fumagalli, M. Fossati, K. V. Nedkova, et al., *The MUSE Ultra Deep Field (MUDF). VI. The relationship between galaxy properties and metals in the circumgalactic medium*, *ApJ*, **974**, 256
L. Sun, X. Wang, H. I. Teplitz, V. Mehta, M. Rafelski, R. A. Windhorst, C. Scarlata, J. P. Gardner, B. M. Smith, B. Sunnquist, et al. including K. V. Nedkova, *The UV luminosity function at $0.6 < z < 1$ from UVCANDELS*, *ApJ*, **972**, 8
M. Revalski, M. Rafelski, A. Henry, M. Fossati, M. Fumagalli, et al. including K. V. Nedkova, *The MUSE Ultra Deep Field (MUDF). V. Characterizing the Mass-Metallicity Relation for Low Mass Galaxies at $z \sim 1 - 2$* , *ApJ*, **966**, 228
X. Wang, H. I. Teplitz, L. Sun, M. Rafelski, N. Grogin, L. Prichard, B. Sunnquist, A. Alavi, R. A. Windhorst, et al. including K. V. Nedkova, *Ultraviolet and Blue Optical Imaging of UVCANDELS*, *RNAAS*, **8**, 26
- 2023** A. Martin, Y. Guo, X. Wang, A. M. Koekemoer, M. Rafelski, H. I. Teplitz, R. A. Windhorst, et al. including K. V. Nedkova, *UV-bright Star-forming Clumps and Their Host Galaxies in UVCANDELS at $0.5 \leq z \leq 1$* , *ApJ*, **955**, 106
M. Revalski, M. Rafelski, M. Fumagalli, M. Fossati, N. Pirzkal, B. Sunnquist, et al. including K. V. Nedkova, *The MUSE Ultra Deep Field (MUDF). III. Hubble Space Telescope WFC3 Grism Spectroscopy and Imaging*, *ApJS*, **265**, 40
- 2022** V. Y. Y. Tan, A. Muzzin, Z. C. Marsan, V. Sok, et al. including K. V. Nedkova, *Resolved Stellar Mass Maps of Galaxies in the Hubble Frontier Fields: Evidence for Mass Dependency in Environmental Quenching*, *ApJ*, **933**, 30
- 2018** 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, *Spatially Extended Low-ionization Emission Regions (LIERs) at $z \sim 0.9$* , *ApJ*, **868**, 16
H. V. Shipley, D. Lange-Vagle, D. Marchesini, G. B. Brammer, L. Ferrarese, M. Stefanon, E. Kado-Fong, K. E. Whitaker, P. A. Oesch, et al. including K. V. Nedkova, *HFF-DeepSpace Photometric Catalogs of the 12 Hubble Frontier Fields, Clusters, and Parallels: Photometry, Photometric Redshifts, and Stellar Masses*, *ApJS*, **235**, 14

ACCEPTED OBSERVING PROPOSALS

- NASA Keck 2025A** : Follow-up LRIS Imaging of Parallel Surveys with JWST (FLIPS-JWST): Revealing How Dust Attenuation Evolves (**PI: K. V. Nedkova, awarded 1.5 nights on Keck/LRIS, \$18650 USD**)
- JWST Cycle 3** : POPPIES: The Public Observation Pure Parallel Infrared Emission-Line Survey (**PIs: J. Kartaltepe & M. Rafelski, including Co-I K. V. Nedkova, major contribution**)
- HST Cycle 32** : DISCS: Direct Imaging Survey of Circumgalactic Structure (**PI: A. Beckett, 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, major contribution**)
- ESO VLT/FORS2 Period 114** : Lifting the Veil: Uncovering the Evolution of Dust Attenuation by Combining VLT/FORS2 and JWST/NIRISS (**PI: A. Battisti, dPI: M. Hayes, including Co-I K. V. Nedkova, major contribution**)

TECHNICAL SKILLS

- Languages** : Python, IDL
- Astronomy** : GALAPAGOS and GalfitM – Multi-wavelength galaxy light profile fitting software
- Tools** GRIZLI – a Grism redshift and line analysis software for space-based slitless spectroscopy
Source Extractor – a software that identifies objects from an astronomical image and builds catalogs
FAST – a code that fits stellar population synthesis templates
EAZY – a photometric redshift code
Dense Basis – a spectral energy distribution fitting code with nonparametric star formation histories

TEACHING EXPERIENCE

- Instructor (2020)** : 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

- 2025** AAS Winter Conference in National Harbor, MD, *scheduled*
- 2024** Astrophysics seminar, University of Missouri, **invited**
Astrophysics seminar, Center for Particle Cosmology at the University of Pennsylvania, **invited**
STScI HotSci Series, Baltimore, MD
Science with Hubble and James Webb Space Telescopes VII: Stars, Gas & Dust in the Universe, 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, Baltimore, MD
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
Astronomy seminar, Tufts University
- 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 AND SERVICE

- 2023-present** Referee for Scientific Journals:
- *Astrophysical Journal (ApJ)*
- *Monthly Notices of the Royal Astronomical Society (MNRAS)*
- *Astronomy and Astrophysics (A&A)*
- 2024-present** Organizer for [Johns Hopkins University/Space Telescope Science Institute Galaxy & AGN Journal Club](#)
- 2024** Served on the Local Organizing Committee for the [2024 STScI Spring Symposium](#)
Served on the Gender Diversity and DEI 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 – 2023** Gave talks at Somerville, Lynn, and Winchester, MA high schools on pursuing STEM degrees
- 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 (1/2 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 first detection of gravitational waves