

Curriculum Vitae

Ivelina G. Momcheva

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EDUCATION

- **University of Arizona, Department of Astronomy** **Tucson, AZ**
Ph.D., Astronomy April 2009
- **St. Kliment Ohridsky University, Department of Physics** **Sofia, Bulgaria**
B.S., Physics with Honors July 2002
Majors: Astronomy, Optics & Spectroscopy

LEADERSHIP AND MANAGEMENT TRAINING

- Leading People and Teams Specialization, Ross School of Business, University of Michigan through Coursera. Expected completion (with certificate): November 2016
- Leadership and Team-building for Astronomers, 1-day Workshop, 225th AAS Meeting, January, 2015
- Yale University Organizational Development & Learning Center workshops completed: "Project Management Lite", "Motivating and Energizing a Team", "Team Effectiveness", "Empowering Others Through Delegation", "Goal Setting and Feedback", 2012-2014

PROFESSIONAL EXPERIENCE

Space Telescope Science Institute, Instrument Division **Baltimore, MD**
Support Scientist, WFC3 Deputy Group Lead 2015 – present

- DASH Lead: developed, characterized and made available the "drift and shift" (DASH) technique for observations using WFC3/IR in Cycle 24. This technique allows observers to tile wide shallow areas using gyro guiding and recover the instrument resolution in post processing, resulting in a factor of four increase in number of pointings per orbit (Momcheva et al., 2016).
- Spectroscopic User Lead: updated and maintain the WFC3 grism-related user resources on the institute website.
- Carrying out analysis to characterize the G102 and G141 grism flat field cubes using calibration data from Cycles 17 to 23. This will be the first re-calibration of the grism flats since TV3.

Yale University, Department of Astronomy **New Haven, CT**
Associate Research Scientist 2014 – 2015
Postdoctoral Researcher 2011 – 2014

- Project Manager for the 3D-HST Treasury Program.
- Manage science and analysis work of the 3D-HST team which consists of ~ 40 scientists worldwide. Work with researchers to maximize the scientific output by tailoring the data products to the scientific needs. Interface between the data team and collaborators to provide science colleagues with the necessary data, resulting in over 50 peer reviewed publications from the team. Create a productive environment for scientific research and a good working atmosphere. Enforce collaboration-wide policies on authorship, data-sharing, publications, etc.
- Lead and coordinate the 3D-HST data team of ~10 people worldwide. Set goals, assign tasks, identify and resolve roadblocks, follow through to completion. Organize weekly telecons. Responsible for the reduction and analysis of > 600 orbits of Hubble ACS and WFC3 spectroscopic observations and > 1000 orbits of Hubble imaging (including all WFC3 CANDELS observations).

- Responsible for producing, organizing and delivering internal and external data releases, and compiling accurate and comprehensive documentation. The team has done 4 internal and 3 external data releases (see van Dokkum et al., 2013; Skelton et al., 2014). A final release was done in October 2015 (Momcheva et al., 2015). Work with the MAST team (A. Koekemoer et al.) to deliver the high-level science products for permanent storage. The 3D-HST photometric and spectroscopic datasets have >650 users.
- Oversee the development of a dedicated Python pipeline for the reduction of HST grism spectra. Carried out testing and debugging in tandem with the pipeline developer Gabriel Brammer. Pipeline is used by a number of HST programs.
- Consult PIs on the reduction and analysis of their WFC3 grism and imaging data. Currently working with the following programs: 12590, 12896, 13437. Collaborate on follow-up surveys in the deep fields such as KMOS-3D (PI: Natascha Förster-Schreiber) and MOSDEF (PI: Mariska Kriek).

Carnegie Institution of Washington, Carnegie Observatories
Postdoctoral Researcher

Pasadena, CA
2009 – 2011

- Led the spectroscopic follow-up for the NewH α survey - a project led by Janice Lee to obtain H α -selected samples at intermediate redshift. Planned and executed 12 nights of observations on the Magellan telescope. Reduced and analyzed the data yielding spectroscopic confirmations for a significant fraction of the sample. Delivered data to the collaboration in the form of catalogs and spectra. Created a MySQL database of the final multi-wavelength dataset. This work is described Momcheva et al. (2013) and the data are published in de los Reyes et al. (2014).
- Led the spectroscopic follow up for Spitzer-selected cluster candidates with Magellan which yielded the discovery of a cluster at $z=1.6$ - the highest redshift cluster at the time (Papovich et al., 2010). Actively participate in follow-up studies.

University of Arizona, Department of Astronomy
Graduate Research Assistant

Tucson, AZ
2002 – 2009

- Carried out a survey of the environments of 28 strong gravitational lens galaxies: observations of > 20,000 targets were done over ~ 40 nights of observations with MMT and Magellan, yielding $\sim 10,000$ unique new redshifts. Collaborated on a pipeline to perform uniform analysis on data from four different spectrographs. Delivered catalogs of redshifts, spectral fits and emission line measurements for the complete sample to the collaboration, which have been used in the thesis work of two students. Results were published in Momcheva et al. (2006, 2015) and Williams et al. (2006).

TECHNICAL SKILLS

- Proficient in analyzing observations from the ACS and WFC3 instruments on HST.
- Proficient in Python, IDL, Perl, SQL, C. Have extensively used scientific software packages under IRAF and IDL. Experienced with version control systems git and svn. Working knowledge of web development with HTML, CSS, PHP, JS and Python. Leads Python workshops: SciCoder and PyLunch. In the process of receiving certification as a Software/Data Carpentry instructor.
- Familiar with data science and high-performance scientific computing methods and techniques such as relational databases (MySQL, PostgreSQL), MapReduce (Hadoop), cloud computing (Amazon Web Services), parallel computing and machine learning.

RESEARCH INTERESTS

- Galaxy evolution and star-formation as a function of environment
- Groups of galaxies, evolution and formation of groups
- Gravitational lensing, environments of gravitational lenses

CONFERENCES AND RESEARCH TALKS (2014 TO PRESENT)

- HotSci Talk: "Science results from the 3D-HST Survey" August, 2016
STScI, Baltimore, MD
- TIPS Talk: "A New Method for (Near-IR) Wide-Field Imaging" June, 2016
STScI, Baltimore, MD
- Colloquium: "Science results from the 3D-HST Survey" March, 2016
NRAO, Green Bank
- Invited talk: "Near-IR Grism Spectroscopy with WFC3: Insights from the 3D-HST Survey" January, 2016
AAS Special Session: Hubble Space Telescope: a Vision to 2020 and Beyond
- Invited talk: "The 3D-HST Survey" November, 2015
Census, Evolution, Physics Conference, New Haven, CT
- Invited talk: "Results from the 3D-HST Survey" April, 2015
Hubble's 25th Anniversary Symposium, Baltimore, MD
- Invited talk: "3D-HST: Overview and Science Results" December, 2014
Columbia University, New York, NY
- Invited talk: "Grism Spectroscopy" August, 2014
STScI Calibration Workshop, Baltimore, MD
- Contributed talk: "3D-HST: The Status of the Survey" May, 2014
3D-HST Team Meeting, Heidelberg, Germany
- Contributed talk, "3D-HST: Overview and Early Science Results" March, 2014
Science with the Hubble Space Telescope IV Conference, Rome, Italy
- FLASH talk: "3D-HST: Overview and Early Science Results" February, 2014
University of Arizona, Steward Observatory, Tucson, AZ
- Colloquium: "Observing Galaxy Evolution with the 3D-HST Survey" January, 2014
Texas A&M University, College Station, TX
- Contributed talk: "Science Highlights from the 3D-HST Survey" January, 2014
223rd AAS Meeting, Washington, DC

SELECTED SCIENTIFIC PUBLICATIONS

- [1] **Momcheva, I.**, van Dokkum, P., van der Wel, A., Brammer, G., MacKenty, J., Nelson, E., Leja, J., Muzzin, A., Franx, M., "A New Method for Wide-Field Near-IR Imaging with the Hubble Space Telescope", arXiv:1603.00465, accepted to PASP
- [2] **Momcheva, I.**, Brammer, G. B., van Dokkum, P. G., Skelton, R. E., Whitaker, et al., "The 3D-HST Survey: Hubble Space Telescope WFC3/G141 grism spectra, redshifts, and emission line measurements for $\sim 100,000$ galaxies", 2016, ApJS, 225, 27M
- [3] Prescott, M. K. M., **Momcheva, I.**, Brammer, G. B.; Fynbo, J. P. U.; Miller, P., "Overturning the Case for Gravitational Powering in the Prototypical Cooling Ly α Nebula", 2015, ApJ, 802, 32P
- [4] **Momcheva, I.**, Williams, K. A., Cool, R. J., Keeton, C. R., Zabludoff, A. I., "A Spectroscopic Survey of the Fields of 28 Strong Gravitational Lenses: The Redshift Catalog", 2015, ApJS, 219, 29M
- [5] Skelton, R. E., Whitaker, K. E., **Momcheva, I.**, Brammer, G. B., van Dokkum, P. G., et al., "3D-HST WFC3-selected Photometric Catalogs in the Five CANDELS/3D-HST Fields: Photometry, Photometric Redshifts and Stellar Masses", 2014, ApJS, 214, 24S
- [6] Leja, J., van Dokkum, P. G., **Momcheva, I.**, Brammer, G., Skelton, R. E., Whitaker, K. E., Andrews, B. H., Franx, M., Kriek, M., van der Wel, A., Bezanson, R., Conroy, C., Forster Schreiber, N., Nelson, E., Patel, S. G., "Exploring the Chemical Link between Local Ellipticals and Their High-redshift Progenitors", 2013, ApJL, 778, L24
- [7] van Dokkum, P., Brammer, G., **Momcheva, I.**, Skelton, R. E., Whitaker, K. E., for the 3D-HST team, "3D-HST Data Release v3.0: Extremely Deep Spectra in the UDF and WFC3 Mosaics in the 3D-HST/CANDELS Fields", 2013, ArXiv e-prints, arXiv:1305.2140

- [8] **Momcheva, I.**, Lee, J. C., Ly, C., Salim, S., Dale, D. A., Ouchi, M., Finn, R., Ono, Y., "Nebular Attenuation in H α -selected Star-forming Galaxies at $z = 0.8$ from the NewH α Survey", 2013, AJ, 145, 47
- [9] Nelson, E. J., van Dokkum, P. G., **Momcheva, I.**, Brammer, G., et al., "The Radial Distribution of Star Formation in Galaxies at $z \sim 1$ from the 3D-HST Survey", 2013, ApJL, 763, L16
- [10] Papovich, C., **Momcheva, I.**, Willmer, C. N. A. et al., "A Spitzer-selected Galaxy Cluster at $z = 1.62$ " , 2010, ApJ, 716, 1503
- [11] **Momcheva, I.**, Williams, K. A., Keeton, C. R., Zabludoff, A.I., "A Spectroscopic Study of the Environments of Gravitational Lens Galaxies" , 2006, ApJ, 641, 169
- [12] Williams, K. A., **Momcheva, I. G.**, Keeton, C. R., Zabludoff, A.I., Lehar, J., "First Results from a Photometric Survey of Strong Gravitational Lens Environments" , 2006, ApJ, 646, 85

PROFESSIONAL REFERENCES

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