

JILLIAN M. BELLOVARY, PH.D

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Current Appointments

ASSISTANT PROFESSOR, QUEENSBOROUGH COMMUNITY COLLEGE	August 2016 - present
RESEARCH ASSOCIATE, AMERICAN MUSEUM OF NATURAL HISTORY	August 2016 - present
PHYSICS FACULTY, CUNY GRADUATE CENTER	July 2019 - present
ACTING DIRECTOR, CUNY MASTERS IN ASTROPHYSICS PROGRAM	November 2021 - present

Previous Positions

HELEN POSTDOCTORAL FELLOW, AMERICAN MUSEUM OF NATURAL HISTORY	June 2015 - August 2016
Supervisor: Mordecai-Mark Mac Low	
Duties: Research involving black hole growth/evolution, oversight of AMNH BridgeUp: STEM educational program for underrepresented high school girls	
POSTDOCTORAL FELLOW, FISK-VANDERBILT BRIDGE PROGRAM, VANDERBILT UNIVERSITY	September 2012 - June 2015
Supervisor: Kelly Holley-Bockelmann	
Duties: Research involving black hole growth/evolution in cosmological simulations, mentor to several Bridge students, Bridge steering committee	
UNIVERSITY OF MICHIGAN	October 2010 - August 2012
Postdoctoral Scholar	
Supervisor: Marta Volonteri	
Duties: Examine black hole seed formation and growth in cosmological simulations	

Education

UNIVERSITY OF WASHINGTON	Fall 2010
Ph.D. in Astronomy	
Thesis Title: "The Formation and Evolution of Massive Black Holes in Cosmological Simulations"	
Thesis Advisors: Fabio Governato & Tom Quinn	
UNIVERSITY OF WISCONSIN-MADISON	May 2001
B.S. in Astrophysics, Physics and Philosophy (triple major)	

Honors

CUNY Feliks Gross Award (2020)
CUNY Junior Faculty Research Award (JFRASE), 2020
NSF Graduate Research Fellow, 2007-2010

Service & Outreach	NASA PHYSICS OF THE COSMOS EXECUTIVE COMMITTEE X-ray and Gravitational Wave SIGs	Dec 2019 - Dec 2021
	NASA LISA STUDY TEAM	Fall 2017 - present
	CHANDRA TIME ALLOCATION COMMITTEE	
	NSF AAFP SELECTION COMMITTEE	
	AAS COMMITTEE FOR THE STATUS OF MINORITIES IN ASTRONOMY	Oct 2015 - Aug 2018
	LOCAL ORGANIZING COMMITTEE Inclusive Astronomy, Vanderbilt University, Nashville, TN	2015
	SACNAS ABSTRACT REVIEWER Give feedback and rank undergraduate and graduate student abstract submissions for the SACNAS annual conference.	2013 - 2015, 2019
	FISSK-VANDERBILT MASTERS-TO-PHD BRIDGE PROGRAM Mentor and member of the steering committee for program to increase the representation of minority Ph.Ds in STEM fields	2012 - 2015
	PRE-MAJOR IN ASTRONOMY PROGRAM (PRE-MAP) Active staff member and mentor for a program to increase diversity in astronomy.	2005 - 2010
	UW PLANETARIUM Presenter for public planetarium shows ~5 times per year.	2004 - 2010
	GRADUATE AND PROFESSIONAL STUDENT SENATE Senator representing the graduate students of the astronomy department.	2009 - 2010
GRADUATE STUDENT ADVISOR Advisor for McNair Scholars and other underrepresented students at the U. Washington Office of Minority Affairs and Diversity.	2005 - 2007	
Professional Training	WRITING INTENSIVE COURSE TRAINING Received training for the development and implementation of Writing Intensive courses at QCC.	2017
	METHODS OF SCIENTIFIC RESEARCH INSTRUCTOR TRAINING Learned techniques for instructing inquiry-based hands-on experiments	Summer 2016
	ISEE PROFESSIONAL DEVELOPMENT PROGRAM Developed and taught a data analysis and coding bootcamp for Columbia Bridge students using inquiry-based methods.	2016
	CIRTL ONLINE COURSE: "AN INTRODUCTION TO EVIDENCE-BASED UNDERGRADUATE STEM TEACHING" Completion Certificate: 2015	
Students Mentored:	<i>Undergraduate Students:</i> Michael Motte (U. Washington, McNair Scholar, English Major) Marrissa Harrison (U. Washington, Anthropology Major) Danielle Green (U. Washington, Biology Major) Cameron Trujillo (Humboldt State University, Physics/Math Major) Colleen Cleary (Hunter College, Physics Major)	

Jonathan Mercedes Feliz (Lehman College, Physics/Math Major)
 Cristian Zambrano (QCC, Computer Science Major)
 Rayhan Shakib (QCC, Computer Science Major)
 Adnan Siraji (QCC, Engineering Major)
 Michelle Luzuriaga (QCC, Physics Major)
 Sarra Hayoune (Hudson County Community College, Physics Major)
 Donovan Vincent (Westchester Community College, Engineering Major)
 Katheryn Chafra (Norwalk Community College, Engineering Major)
 Diana Gonzalez-Argueta (Hudson County Community College, Physics Major)
 Joshua Olatunji (QCC, Engineering Major)
 Jahmel Saltus (QCC, Physics Major)
 Victoria De Cun (Florida International University, Physics Major)
 Marcus Dormena (City College of New York, Physics Major)
 Giselle Guaman (Hudson County Community College, Comp. Sci Major)
 John Meftah (QCC, Physics Major)
 Tony Luo (QCC, Physics Major)
 Matthew Fennell (QCC, Physics Major)
 Dennis Li (QCC, Physics Major)

Graduate Students:

Sandor Van Wassenhove (U. Michigan, PhD Astronomy)
 Bryan Demapan (Fisk U., M.A. Physics)
 Jodie Hawk (Fisk U.)
 Nicole Sanchez (Fisk U., now at U. Washington PhD program)
 Glenna Dunn (Vanderbilt University, PhD Astrophysics)
 Daven Cocroft (University of Toronto)

**Invited
Talks
since 2018**

ASTRONOMY COLLOQUIUM, COLUMBIA UNIVERSITY	April 2022
ASTRONOMY COLLOQUIUM, FLATIRON CCA	March 2022
COLLOQUIUM, DARTMOUTH COLLEGE	October 2021
COLLOQUIUM, NEW MEXICO STATE UNIVERSITY	September 2021
COLLOQUIUM, WASHINGTON STATE UNIVERSITY	September 2020
COLLOQUIUM, NEW YORK UNIVERSITY - ABU DHABI	September 2019
COLLOQUIUM, GEORGE MASON UNIVERSITY	May 2019
ACCRETION SIGNATURES OF THE EARLIEST BLACK HOLES IN THE UNIVERSE, PRINCETON UNIVERSITY	April 2019
SEMINAR, INSTITUTE FOR THEORY AND COMPUTATION, HARVARD-SMITHSONIAN CENTER FOR ASTROPHYSICS	February 2019
COLLOQUIUM, UNIVERSITY OF FLORIDA	November 2018
GRAVITATIONAL WAVE WORKSHOP, COLEGIO DE FISICA FUNDAMENTAL Y INTERDISCIPLINARIA DE LAS AMERICAS	October 2018
COLLOQUIUM, NASA GODDARD	May 2018
COLLOQUIUM, LAGUARDIA COMMUNITY COLLEGE	April 2018
PRESIDENTIAL LECTURE, QUEENSBOROUGH COMMUNITY COLLEGE	April 2018
YCAA SEMINAR, YALE UNIVERSITY	April 2018

SEMINAR, EMPIRE STATE COLLEGE	March 2018
COLLOQUIUM, BROOKLYN COLLEGE	March 2018
WESTPORT ASTRONOMICAL SOCIETY, WESTPORT, CT	January 2018
LISA SPECIAL SESSION, AAS 231ST MEETING	January 2018

**Professional
Memberships**

AMERICAN ASTRONOMICAL SOCIETY
 SOCIETY FOR THE ADVANCEMENT OF CHICANOS AND NATIVE AMERICANS
 IN SCIENCE (SACNAS)
 NATIONAL SOCIETY OF BLACK PHYSICISTS (NSBP)

**Proposals &
Grants**

SIMONS FOUNDATION PRESIDENTIAL DISCRETIONARY GRANT: CUNY MASTERS IN ASTROPHYSICS BRIDGE PROGRAM (PI)
 \$4,100,000
 January 2022

SMITHSONIAN ASTROPHYSICAL OBSERVATORY: VERIFYING A NEW METHOD TO DISCOVER AGN IN DWARF GALAXIES (PI)
 \$34,000
 January 2022

NSF AAG WoU-MMA: TUNING IN TO THE ECHOES OF BLACK HOLE SEEDS (PI)
 \$278,000
 September 2021

CUNY JUNIOR FACULTY RESEARCH AWARD IN SCIENCE & ENGINEERING (JFRASE) – HOW TO BUILD A SUPERMASSIVE BLACK HOLE
 \$50,000
 March 2020

NSF AAG COLLABORATIVE RESEARCH: OF MICE AND MONSTERS – INVESTIGATING THE GROWTH OF BLACK HOLES IN DWARF GALAXIES (Co-PI)
 \$49,000
 September 2018

PSC-CUNY: GRAVITATIONAL WAVE SIGNATURES OF MASSIVE BLACK HOLES IN DWARF GALAXIES
 \$3500
 May 2018

XSEDE: FORMING DIRECT COLLAPSE BLACK HOLES WITH REALISTIC LYMAN-WERNER RADIATION FIELDS IN COSMOLOGICAL HYDRODYNAMIC SIMULATIONS (PI)
 698,436 hours (\$24,220 equivalent)
 December 2015

PSC-CUNY: PREDICTING GRAVITATIONAL WAVE SIGNALS BY MERGING BLACK HOLES IN MIGRATION TRAPS
 \$3500
 May 2017

CUNY- CCRG: CHARACTERIZING MASSIVE BLACK HOLES IN SIMULATIONS OF DWARF GALAXIES
 \$9500
 August 2017

- First Author Refereed Publications** THE ORIGINS OF OFF-CENTRE MASSIVE BLACK HOLES IN DWARF GALAXIES
Bellovary, J. M., Hayoune, S., Chafra, K., Vincent, D., Brooks, A., Christensen, C., Munshi, F., Tremmel, M., Quinn, T., Van Nest, J., Sligh, S., Luzuriaga, M., 2021, MNRAS, 505, 5129
- MULTIMESSENGER SIGNATURES OF MASSIVE BLACK HOLES IN DWARF GALAXIES
Bellovary, J. M., Cleary, C., Munshi, F., Tremmel, M., Christensen, C., Brooks, A., Quinn, T., 2019, MNRAS, 482, 2913
- MIGRATION TRAPS IN DISKS AROUND SUPERMASSIVE BLACK HOLES
Bellovary, J. M., Mac Low, M.-M., McKernan, B., Ford, K. E. S., 2016, ApJL, 819, L17
- EFFECTS OF INCLINATION ON MEASURING VELOCITY DISPERSION AND IMPLICATIONS FOR BLACK HOLES
Bellovary, J. M., Holley-Bockelmann, K., Gültekin, K., Christensen, C., Governato, F., Brooks, A., Loebman, S., Mushi, F., 2014, MNRAS, 445, 2667
- THE RELATIVE ROLE OF GALAXY MERGERS AND COSMIC FLOWS IN FEEDING BLACK HOLES
Bellovary, J. M., Brooks, A., Volonteri, M., Governato, F., Quinn, T., Wadsley, J., 2013, ApJ, 779, 136
- THE FIRST MASSIVE BLACK HOLE SEEDS AND THEIR HOSTS
Bellovary, J. M., Volonteri, M., Governato, F., Shen, S., Quinn, T., & Wadsley, J., 2011, ApJ, 742, 13
- WANDERING BLACK HOLES IN GALAXY HALOS
Bellovary, J. M., Governato, F., Quinn, T.R., Wadsley, J., Shen, S., & Volonteri, M., 2010, ApJL, 721, 148
- THE ROLE OF THE RADIAL ORBIT INSTABILITY IN DARK MATTER HALO FORMATION AND STRUCTURE
Bellovary, J. M., Dalcanton, J.J., Babul, A., Quinn, T.R., Maas, R.W., Austin, C.G., Williams, L.L.R., Barnes, E.I., 2008, ApJ, 685, 739
- SPECTROPOLARIMETRIC CLUES TO THE STRUCTURE AND EVOLUTIONARY STATUS OF MWC 349A
Meyer, J. M., Nordsieck, K.H., Hoffman, J.L., 2002, AJ, 123, 1639
- Other Refereed Publications** RESOLVE AND ECO: FINDING LOW-METALLICITY $z \sim 0$ DWARF AGN CANDIDATES USING OPTIMIZED EMISSION-LINE DIAGNOSTICS
Polimera, M., Kannappan, S., Richardson, C., Bittner, A., Ferguson, C., Moffett, A., Eckert, K., **Bellovary, J.**, Norris, M., and The RESOLVE TEAM; 2022, submitted to AAS Journals
- OPTICAL AND JWST MID-IR EMISSION LINE DIAGNOSTICS FOR SIMULTANEOUS IMBH AND STELLAR EXCITATION IN $z \sim 0$ DWARF GALAXIES
Richardson, C.T., Simpson, C., Polimera, M., Kannappan, S., **Bellovary, J.**, Greene, C., Jenkins, J.; 2022, accepted to ApJ
- MERGING BLACK HOLES IN DWARF GALAXIES: CALCULATING BLACK HOLE COALESCENCE BINARY TIMESCALES FROM SIMULATIONS FOR LISA DETECTION
De Cun, V. I.; **Bellovary, J.**, Katz, M.; 2021, submitted to MNRAS
- ALIGNING NUCLEAR CLUSTER ORBITS WITH AN ACTIVE GALACTIC NUCLEUS ACCRETION DISK
Fabj, G., Nasim, S., Caban, F., Ford, K.E.S., McKernan, B., **Bellovary, J.**; 2020, MNRAS, 499, 2608

ORBITAL MIGRATION OF INTERACTING STELLAR MASS BLACK HOLES IN DISKS AROUND SUPERMASSIVE BLACK HOLES II. SPINS AND INCOMING OBJECTS

Secunda, A., **Bellovary, J.**, Mac Low, M., Ford, K.E.S., McKernan, B., Leigh, N., Lyra, W., Sandor, Z., Adorno, J.; 2020, ApJ, 903, 133

BLACK HOLE GROWTH AND FEEDBACK IN ISOLATED ROMULUS25 DWARF GALAXIES

Sharma, R., Brooks, A., Somerville, R., Tremmel, M., **Bellovary, J.**, Wright, A., Quinn, T., 2020, ApJ, 897, 103

THE ROLE OF GRAVITATIONAL RECOIL IN THE ASSEMBLY OF MASSIVE BLACK HOLE SEEDS

Dunn, G., Holley-Bockelmann, K., **Bellovary, J.**; 2020, ApJ, 896, 72

THE EVOLUTION OF KICKED STELLAR-MASS BLACK HOLES IN STAR CLUSTER ENVIRONMENTS II: ROTATING STAR CLUSTERS

Webb, J., Leigh, N., Serrano, R., **Bellovary, J.**, Ford, K.E.S., McKernan, B., Spera, M., Trani, A., 2019, MNRAS, 488, 3055

ORBITAL MIGRATION OF INTERACTING STELLAR MASS BLACK HOLES IN DISKS AROUND SUPERMASSIVE BLACK HOLES

Secunda, A., **Bellovary, J.**, Mac Low, M., Ford, K.E.S., McKernan, B., Leigh, N., Lyra, W., 2019, ApJ, 878, 85

CONSTRAINING STELLAR MASS BLACK HOLE MERGERS IN AGN DISKS DETECTABLE WITH LIGO

McKernan, B., Ford, K.E.S., **Bellovary, J.**, Leigh, N., Haiman, Z., Bocsis, B., Lyra, W., MacLow, M., Metzger, B., O'Dowd, M., Endlich, S., Rosen, D., 2018, ApJ, 866, 66

SOWING BLACK HOLE SEEDS: DIRECT COLLAPSE BLACK HOLE FORMATION WITH REALISTIC LYMAN-WERNER RADIATION IN COSMOLOGICAL SIMULATIONS

Dunn, G., **Bellovary, J.**, Holley-Bockelmann, K., Christensen, C., Quinn, T., 2018, ApJ, 861,39

COSMOLOGICAL HYDRODYNAMIC SIMULATIONS OF PREFERENTIAL ACCRETION IN THE SMBH OF MILKY WAY SIZE GALAXIES

Sanchez, N., **Bellovary, J.**, Holley-Bockelmann, K., Tremmel, M., Brooks, A., Governato, F., Quinn, T., Volonteri, M., Wadsley, J., 2018, ApJ, 860, 20

ON THE RATE OF BLACK HOLE BINARY MERGERS IN GALACTIC NUCLEI DUE TO DYNAMICAL HARDENING

Leigh, N., Geller, A., McKernan, B., Ford, K. E. S., Mac Low, M. -M., **Bellovary, J.**, Haiman, Z., Lyra, W., Samsing, J., O'Dowd, M., Kocsis, B., Endlich, S., 2018, MNRAS, 474, 5672

THE EVOLUTION OF KICKED STELLAR-MASS BLACK HOLES IN STAR CLUSTER ENVIRONMENTS

Webb, J., Leigh, N., Singh, A., Ford, K. E. S., McKernan, B., **Bellovary, J.**, 2018, MNRAS, 474, 3835

THE CONTRIBUTION OF OUTER H I DISKS TO THE MERGING BINARY BLACK HOLE POPULATION

Chakrabarti, S., Chang, P., O'Shaughnessy, R., Brooks, A., Shen, S., **Bellovary, J.**, Gladysz, W., Belczynski, C., 2017, ApJ, 840, 4

THE ROMULUS COSMOLOGICAL SIMULATIONS; A PHYSICAL APPROACH TO THE FORMATION, DYNAMICS AND ACCRETION MODELS OF SMBHS

Tremmel, M., Karcher, M., Governato, F., Volonteri, M., Quinn, T., Pontzen, A., Anderson, L., **Bellovary, J.**; 2017, MNRAS, 470, 1121

THE BIRTH OF A SUPERMASSIVE BLACK HOLE BINARY

Pfister, H., Lupi, A., Capelo, P., Volonteri, M., **Bellovary, J.**, Dotti, M.; 2017, MNRAS, 471, 3646

A SURVEY OF DUAL ACTIVE GALACTIC NUCLEI IN SIMULATIONS OF GALAXY MERGERS: FREQUENCY AND PROPERTIES

Capelo, P., Dotti, M., Volonteri, M., Mayer, L., **Bellovary, J.**, Shen, S.; 2017, MNRAS, 469, 4437

THE PAIRING OF ACCRETING MASSIVE BLACK HOLES IN MULTIPHASE CIRCULAR DISKS: THE INTERPLAY BETWEEN RADIATIVE COOLING, STAR FORMATION, AND FEEDBACK PROCESSES

Souza Lima, R., Mayer, L., Capelo, P., **Bellovary, J.**, 2017, ApJ, 838, 13

BAR-DRIVEN EVOLUTION AND QUENCHING OF SPIRAL GALAXIES IN COSMOLOGICAL SIMULATIONS

Spinoso, D., Bonoli, S., Dotti, M., Mayer, L., Madau, P., **Bellovary, J.**, 2017, MNRAS, 465, 3729

SUPERMASSIVE BLACK HOLE PAIRS IN CLUMPY GALAXIES AT HIGH REDSHIFT: DELAYED BINARY FORMATION AND CONCURRENT MASS GROWTH

Tamburello, V.; Capelo, P.; Mayer, L.; **Bellovary, J.**; Wadsley, J.; 2017; MNRAS, 464, 2952

THE EFFECTS OF HOST GALAXY PROPERTIES ON MERGING COMPACT BINARIES DETECTABLE BY LIGO

O'Shaughnessy, R., **Bellovary, J.**, Brooks, A., Shen, S., Governato, F., Christensen, C., 2017, MNRAS, 464, 2831

BLACK HOLE STARVATION AND BULGE EVOLUTION IN A MILKY WAY-LIKE GALAXY

Bonoli, S.; Mayer, L.; Kazantzidis, S.; Madau, P.; **Bellovary, J.**; Governato, F.; 2016, MNRAS, 459, 2603

A COMPARISON OF BLACK HOLE GROWTH IN GALAXY MERGERS WITH GASOLINE AND RAMSES

Gabor, J.; Capelo, P.; Volonteri, M.; Bournaud, F.; **Bellovary, J.**; Governato, F.; Quinn, T.; 2016, A&A, 819, 17

BLACK HOLE ACCRETION VERSUS STAR FORMATION RATE: THEORY CONFRONTS OBSERVATIONS

Volonteri, M.; Capelo, P.; Netzer, H.; **Bellovary, J.**; Dotti, M.; Governato, F.; 2015, MNRAS, 452, 6

GROWING BLACK HOLES AND GALAXIES: BLACK HOLE ACCRETION VERSUS STAR FORMATION RATE

Volonteri, M.; Capelo, P.; Netzer, H.; **Bellovary, J.**; Dotti, M.; Governato, F.; 2015, MNRAS, 449, 1470

MASSIVE BLACK HOLE SCIENCE WITH ELISA

Barausse, E.; **Bellovary, J.**; Berti, E.; Holley-Bockelmann, K.; Farris, B.; Sathyaprakash, B.; Sesana, A.; JPhCS, 610, 012001

GROWTH AND ACTIVITY OF BLACK HOLES IN GALAXY MERGERS WITH VARYING MASS RATIOS

Capelo, P.; Volonteri, M.; Dotti, M.; **Bellovary, J.**; Mayer, L.; & Governato, F.; 2015, MNRAS, 447, 2123

NUCLEAR COUPS: DYNAMICS OF BLACK HOLES IN GALAXY MERGERS

Van Wassenhove, S.; Capelo, P.; Volonteri, M.; Dotti, M.; **Bellovary, J.**; Mayer, L.; & Governato, F.; 2013, MNRAS, 439, 474

BLACK HOLES IN THE EARLY UNIVERSE

Volonteri, M., & **Bellovary, J.**, 2012, Reports on Progress in Physics, 75, 124901

MILKY WAY TOMOGRAPHY IV: DISSECTING DUST

Berry, M., Ivezić, Ž., Sesar, B., Jurić, M., Schlafly, E., **Bellovary, J.**, et al.; 2012, ApJ, 757, 166

OBSERVABILITY OF DUAL AGN IN MERGING GALAXIES

Van Wassenhove, S.; Volonteri, M., Mayer, L., Dotti, M., **Bellovary, J.**, & Callegari, S.; 2012, ApJL, 748, 7

SMBH FORMATION VIA GAS ACCRETION IN NUCLEAR STELLAR CLUSTERS

Davies, M. B.; Miller, M. C.; & **Bellovary, J.M.**; 2011, ApJL, 740, 42

GROWING MASSIVE BLACK HOLE PAIRS IN MINOR MERGERS OF DISK GALAXIES

Callegari, S.; Kazantzidis, S.; Mayer, L.; Colpi, M.; **Bellovary, J. M.**; Quinn, T.; Wadsley, J., 2011, ApJ, 729, 85

STAR FORMATION AND FEEDBACK IN SPH SIMULATIONS II: RESOLUTION EFFECTS

Christensen, C., Quinn, T., Stinson, G., **Bellovary, J.**, Wadsley, J., 2010, ApJ, 717, 121

THE NATURE OF HI ABSORBERS IN GRB AFTERGLOWS: CLUES FROM HYDRODYNAMIC SIMULATIONS

Pontzen, A., Deason, A., Governato, F., Pettini, M., Wadsley, J., Quinn, T., Brooks, A., **Bellovary, J.**, & Fynbo, J. , 2010, MNRAS, 402, 1523

A LARGE, UNIFORM SAMPLE OF X-RAY-EMITTING ACTIVE GALACTIC NUCLEI FROM THE ROSAT ALL SKY AND SLOAN DIGITAL SKY SURVEYS: THE DATA RELEASE 5 SAMPLE

Anderson, S. F., Margon, B., Voges, W., Plotkin, R. M., Syphers, D., Haggard, D. Collinge, M.J., **Meyer, J.M.**, Strauss, M.A., Agüeros, M. A., et al. 2007, AJ, 133, 313