

ANIL C. SETH

Curriculum Vitae & Publication List

Updated February 17, 2023

Office Address

Dept. of Physics & Astronomy
 University of Utah
 201 James Fletcher Building
 115 South, 1400 East
 Salt Lake City, UT 84112-0830

Contact Information

Phone: (801) 585-7793
 Fax: (801) 581-4801
 E-mail: aseth@astro.utah.edu
 Web: <http://www.physics.utah.edu/~aseth>

Education UNIVERSITY OF WASHINGTON June 2006
 Ph.D. in Astronomy
 Thesis Title: “The Formation and Evolution of Late-Type Galaxies”
 Thesis Advisors: Paul Hodge & Julianne Dalcanton

UNIVERSITY OF WASHINGTON Dec. 2001
 M.S. in Astronomy

WESLEYAN UNIVERSITY May 1998
 B.A. in Physics, Astronomy & Music, with honors in Astronomy

Professional Experience PROFESSOR, PHYSICS & ASTRONOMY, UNIVERSITY OF UTAH 2022 – Present
 ASSOCIATE PROFESSOR, PHYSICS & ASTRONOMY, UNIVERSITY OF UTAH 2017 – 2022
 ASSISTANT PROFESSOR, PHYSICS & ASTRONOMY, UNIVERSITY OF UTAH 2011 – 2017
 LEAVE REPLACEMENT PROFESSOR, WELLESLEY COLLEGE 2010 – 2011
 Part-time position to design and teach two courses.
 CFA & OIR POSTDOCTORAL FELLOWSHIPS, HARVARD-SMITHSONIAN CENTER FOR ASTROPHYSICS 2006 – 2011
 Worked independently on topics including nuclear star clusters and resolved stellar populations.

Group **Postdocs Advised:** Mark den Brok (2012–2015), Karina Voggel (2016–2019)
Graduate Students Advised: David Ohlson (2022–), Callie Clontz (2022–), Kameron Goold (2022–), Christian Hannah (2020–), Ben Gibson (2020–), Aishwarya Ashok (Utah, 2018–2022), Antoine Dumont (Utah, 2017–2022), Renuka Pechetti (Utah, 2015–2020), Chris Ahn (Utah, 2014–2018), Dieu Nguyen (Utah, 2012–2018), Cliff Johnson (U. Washington, 2010–2015, primary advisor for thesis project)
Undergraduate and Post-Bac Students Advised: Bailey Day (2023), Zack Freeman (2022–), Ethan Lame (2021), Aasutosh Acharya (2021), David Ohlson (2020–2021), Addie Wilkerson (ACCESS, 2020), Estephani TorresVillanueva (2019–2021), Tobin Wainer (2019–2021), Olivia Cooper (REU, 2018), Lexie Wilson (Honors Thesis, 2017), Candace Bryn (ACCESS, 2017), Timothy Bell (REU, 2016–2017), Julie Tang (ACCESS, 2016), Ellie Penner (ACCESS, 2015–2016), Jordan Bulkley (2014–2017), Gina Eastes (ACCESS, 2015), Alex Deich (2014–2015), Dylan Gregersen (2013–2015), Chris DiLullo (REU, 2014), Brian Kimmig (2012–2014), Matt Wallace (2013–2014), Katharine Larsen (Wellesley/Utah, 2011–2013), Nell Byler (Wellesley, 2011)

Grants & Awards in Utah

JAMES WEBB SPACE TELESCOPE CYCLE 1 GUEST OBSERVER PROGRAM <i>Revealing Low Luminosity Active Galactic Nuclei (ReveaLLAGN)</i> , PI, \$244,548.	2022–2025
NSF AST AAG GRANT <i>Counting the Unseen: Massive Black Hole Demographics from Tidal Disruption Events</i> , PI, \$299,637.	2021–2024
PRESIDENTIAL SCHOLAR, UNIVERSITY OF UTAH <i>Honors extraordinary research and academic efforts of early to mid-career faculty</i> , \$30,000.	2019–2021
NSF AST AAG GRANT <i>A Pioneering Test of Stellar Population Complexity Outside the Milky Way</i> , co-PI, \$276,562.	2019–2022
NSF AST AAG GRANT <i>Collaborative Research: Exploring the Dark Side of NGC 5128</i> , co-PI, \$191,991	2018–2021
NASA WFIRST SCIENCE INVESTIGATION TEAM <i>WFIRST Infrared Nearby Galaxies Survey</i> , co-I, \$101,025	2017–2021
HUBBLE SPACE TELESCOPE GUEST OBSERVER & ARCHIVAL GRANTS <i>Probing Omega Cen's Stellar Mass Black Hole Population Through Microlensing</i> , \$139,950, 2023-2025 <i>Deciphering the Formation History of Omega Cen with a Comprehensive Stellar Kinematic and Population Dataset</i> , \$135,113, 2022–2024 <i>Solving the Mystery of Galaxy Bulges</i> , co-I, 54 orbits, 18 orbits, \$165,197, 2017–2022 <i>Increasing Diversity in Galaxies with BH Mass Measurements</i> , PI, 6 orbits, \$46,265, 2017–2020 <i>A Legacy Imaging Survey of M33</i> , co-I, 108 orbits, \$54,348, 2016–2020 <i>Improving Central Black Hole Mass Measurements in Low Mass Early Type Galaxies</i> , PI'ed by student Dieu Nguyen, 12 orbits, \$57,687, 2016–2021 <i>Searching for a Supermassive Black Hole in the Brightest Ultracompact Dwarf Galaxy</i> , PI'ed by student Chris Ahn, 1 orbit, \$15,367, 2015–2018 <i>Black Holes and Central M/Ls in Low Mass Early-Type Galaxies</i> , PI, \$61,085, 2015–2018 <i>The Structure of the Nearest Nuclear Star Clusters</i> , PI, \$116,854, 2013–2018 <i>Weighing the Low Mass Black Hole in NGC 404</i> , PI, 6 orbits, \$57,422, 2011–2014	2011–Present
NATIONAL SCIENCE FOUNDATION <i>CAREER: Understanding the Formation of Galaxy Nuclei</i> , PI, \$598,520	2014–2019

Selected Telescope Time

REVEALING LOW LUMINOSITY ACTIVE GALACTIC NUCLEI (REVEALLAGN) James Webb Space Telescope, NIRSpec & MIRI, Medium Program, PI, 31.9 hours.	2021, Cycle 1
THE FORMATION HISTORY OF OMEGA CENTAURI Hubble Space Telescope, 18 orbits using WFC3 imaging, PI, 2021, Cycle 29 Very Large Telescope, MUSE instrument, 24.3 hours, co-I, 2020	2020–
GALAXIES AND THEIR CENTRAL BLACK HOLES Gemini North, 253 hours (Large & Long Program), co-I, using NIFS instrument.	2016-2021
WEIGHING LOW MASS BLACK HOLES IN THE NEAREST AGN Atacama Large Millimeter Array, 5.4 hours, PI	Cycle 3, 2015-16
A GNIRS SURVERY OF THE NEAREST NUCLEAR STAR CLUSTERS Gemini North, 13.1 hours, PI, using GNIRS instrument	2016A
RESOLVING THE NATURE OF ULTRACOMPACT DWARFS Gemini North, 40.7 hours, PI, using NIFS instrument	2014A,2015A

Telescope time listed above is allocated through competitive proposals with oversubscription rates for PI'ed proposals ranging from 3–9. Approximate Monetary Cost of Telescope Time Awarded as PI Since Arrival in Utah – \$3,120,000

Teaching Experience	KECK LECTURER IN DARK SKY STUDIES	2019 – 2021
	Helped develop interdisciplinary dark skies minor at U. of Utah. Ongoing support of minor.	
	EARLY CAREER TEACHING AWARD, UNIVERSITY OF UTAH	Mar. 2018
	ASSISTANT & ASSOCIATE PROFESSOR, UNIVERSITY OF UTAH	2012 – Present
	Taught 90-person introductory astronomy course (1060; Spring 2012), 25 person observational astronomy course (2060/4060; Fall 2012), 10-14 person graduate level extragalactic astronomy course (5570; Spring 2013, 2015, 2017, Fall 2020), 14-24 person observational astronomy course (2060/4060; Fall 2013, Fall 2014, Fall 2015, Fall 2018), started new undergraduate extragalactic astrophysics course (Fall 2016, 2017, 2021), graduate research methods in astronomy (6410; Spring 2018, 2020, 2021, 2022), instructor for new Being Human in STEM course (SCI3900; Spring 2020).	
	VISITING PROFESSOR, WELLESLEY COLLEGE	2010 – 2011
	Taught undergraduate seminar on stellar populations and general education astrobiology course.	
U. of Utah Service	TEACHING EXCELLENCE COMMITTEE	2022–Present
	POST BACCALAUREATE PROGRAM STEERING COMMITTEE	2022–Present
	Helped finalize, judge applicants, and support incoming students.	
	EXECUTIVE COMMITTEE, PHYSICS & ASTRONOMY DEPARTMENT	2021–Present
	Member of three person committee advising chair on key decisions.	
	DEPARTMENT ACTION AND LEADERSHIP INSTITUTE	2021
	Led proposal to attend 2021 intensive workshop on departmental change.	
	DIRECTOR OF UNDEGRADUATE STUDIES	2020–Present
	Led reform of undergraduate physics program (chair of reform committee).	
	CURRICULUM COMMITTEES	2020–Present
	Chaired departmental curriculum committee (2020-2021), part of college curriculum committee.	
GRADUATE ADVISORY COMMITTEE	2018	
Helped reform the department's graduate program.		
HONORS COLLEGE ADVISOR (CHAIR)	2012 – 2020	
Updated honors requirements, interface with honors students. Awarded \$1,000 for service in 2014.		
ASTRONOMY TASK FORCE (CHAIR, 2017–2018, 2019–2020)	2011 – Present	
Helped create astronomy & astrophysics graduate and undergraduate emphases.		
Additional Committees & Service: Astronomy Faculty Search Committee (2015–2016 [chair], 2020–2021), Career Line Faculty Search Committee (2021–2022), South Physics Observatory Committee (2012–2019, chair), High Energy Astrophysics Seminar Committee (2012-2013, chair 2013-14, chair 2016-17), Policy Board (2014-2015), Undergraduate Advising Committee (2012 – Present), Conference for Undergraduate Women in Physics (2014), College of Science Academic Appeals Committee (2011 – 2014), College of Science Council (2017-2019), Futures Committee (2017-2018), Outreach Committee (2017-2018)		
Recent Professional Service	NSF ASTRONOMY & ASTROPHYSICS GRANT PANELIST	2020
	SLOAN DIGITAL SKY SURVEY V ADVISORY COMMITTEE	2019–Present
	NOAO SURVEY TIME ALLOCATION COMMITTEE	2018
	SCIENTIFIC ORGANIZING COMMITTEE	2017
	<i>The Exciting Lives of Galactic Nuclei</i> , Ringberg Castle, Germany.	
	HUBBLE SPACE TELESCOPE TIME ALLOCATION COMMITTEE	2015, 2016
	REFeree & TAC EXTERNAL REVIEWER	2009 – Present
Refereed papers for Nature, Nature Astronomy, AAS Journals, Monthly Notices of the RAS, James Webb Space Telescope, NSF ASCEND		

Recent Talks

Recent Invited seminars or colloquia: Weber St. (Feb. 2023), Pabna University (Jan. 2022, virtual), Edinburgh (Dec. 2020, virtual), McGill (Oct. 2019), Columbia (Oct. 2019), Washington (May 2019), MPE-Garching (Jul. 2018), Distinguished Colloquium Washington State (Mar. 2018), Michigan (Nov. 2017), Michigan St. (Nov. 2017), MPIA-Heidelberg (June 2017 & Dec. 2016) Invited Talk & Panelist *241st Meeting of the American Astronomical Society*, Seattle, Washington, Jan. 2023

Invited Talk, *Origin, growth and feedback of black holes in dwarf galaxies*, San Sebastian, Spain, Sep. 2022

Contributed Talk, *Intermediate Mass Black Holes: New Science from Stellar Evolution to Cosmology*, San Juan PR, Apr. 2022

Contributed Talk, *Dynamical Formation of Gravitational Wave Sources*, Aspen, Jan. 2022

Contributed Talk, *American Astronomical Society Virtual Meeting*, Jan. 2021

Contributed Talk, *Supermassive Black Holes (organized by U. de Chile)*, Dec. 2020

Invited Review *Globular Clusters at the Nexus of Star and Galaxy Formation KITP Virtual Workshop*, May 2020

Contributed Talk *MODEST-20: Dense Star Clusters in the Era of Large Surveys*, Mumbai, India, Feb. 2020

Invited Review *IAU Symposium 351: Star Clusters: from the Milky Way to the Early Universe*, Bologna, Italy, May 2019

Invited Speaker *Formation of Stars and Massive clusters in Dwarf Galaxies over Cosmic Time*, Lorentz Center, Leiden, the Netherlands, Feb. 2019

Invited Speaker *M33 HST Survey Team Meeting*, Ringberg Castle, Germany, Jul. 2018

Contributed Talk *Using tidal disruption events to study super-massive black holes*, Aspen, Jan. 2018

Invited Speaker, *Globular cluster systems and their host galaxies*, Sexten, Italy, Jun. 2017

Invited Speaker, *Exciting Lives of Galaxy Nuclei*, Ringberg Castle, Germany, Feb. 2017

Selected Outreach

Astronomy Outreach Internships at Bryce Canyon: creation, fund raising, and administration, 2015–Present. Interns have ~10,000 direct interactions per year

American Indian Students Dark Sky & Astronomy Event, July 2022

Bryce Canyon Astronomy Festival, June 2022

Public Talk, Timpanogos Club, Jan. 2022

Frontiers of Science Talk & Video, Mar. 2021

Public Talks, Utah Astronomy Club, Utah Valley Astro Club, Fall 2019

Citizen science project, clustersearch.org, >1000 volunteers, Jan. 2019

Regular volunteer at star parties in the department and at astronomy festivals

2019: Lunar Eclipse Event at UofU, 2018: IDA conference Snowbird, Cedar Breaks

Astronomy Outreach Ranger Training Session; organized and taught

Bryce Canyon NP, May 2015 (1 week; 25 attendees), Arches NP, May 2018 (1 day; 20 attendees)

Public Talk, Clark Planetarium, ~250 people, Jul. 2018

Public Talk, U to You series (Park City), ~200 people, Mar. 2018

Public Talk at Natural History Museum on Eclipse, ~100 people, Aug. 2017

Dedication of the 1.7m Clements Reflector, ~100 people, Jul. 2017

- Refereed Publications** **Summary:** 35 group or first authored publications plus 130 co-authored publications.
Total citation count: 9514, *h*-index: 57, [Click here for ADS listing](#)
- First- Author or Group Publications**
- 35) A POPULATION OF LUMINOUS GLOBULAR CLUSTERS AND STRIPPED NUCLEI WITH ELEVATED MASS TO LIGHT RATIOS AROUND NGC 5128
Dumont, A., **Seth, A.**, [9 authors], 2022, *ApJ*, 928, 147.
- 34) THE PANCHROMATIC HUBBLE ANDROMEDA TREASURY: TRIANGULUM EXTENDED REGION (PHATTER). III.
THE MASS FUNCTION OF YOUNG STELLAR CLUSTERS IN M33 Wainer, T., Johnson, C., **Seth, A.**, [7 authors], 2022, *ApJ*, 928, 15.
- 33) FIRST DIRECT DYNAMICAL DETECTION OF A DUAL SUPERMASSIVE BLACK HOLE SYSTEM AT SUB-KILOPARSEC SEPARATION
Voggel, K., **Seth, A.**, [8 authors], 2022, *A&A*, 658, 152.
- 32) DETECTION OF A 100,000 M_{\odot} BLACK HOLE IN M31'S MOST MASSIVE GLOBULAR CLUSTER: A TIDALLY STRIPPED NUCLEUS
Pechetti, R., **Seth, A.**, [7 authors], 2022, *ApJ*, 924, 48.
- 31) SPATIALLY RESOLVING THE STAR FORMATION HISTORIES OF THREE NEARBY NUCLEAR STAR CLUSTERS
Hannah, C., **Seth, A.**, [5 authors], 2021, *AJ*, 162, 281.
- 30) LUMINOSITY MODELS AND DENSITY PROFILES FOR NUCLEAR STAR CLUSTERS FOR A NEARBY VOLUME-LIMITED SAMPLE OF 29 GALAXIES
Pechetti, R., **Seth, A.**, [4 authors], 2020, *ApJ*, 900, 32.
- 29) A GAIA-BASED CATALOG OF CANDIDATE STRIPPED NUCLEI AND LUMINOUS GLOBULAR CLUSTERS IN THE HALO OF CENTAURUS A
Voggel, K., **Seth, A.**, [5 authors], 2020, *ApJ*, 899, 140.
- 28) SURPRISINGLY STRONG K-BAND EMISSION FOUND IN LOW-LUMINOSITY ACTIVE GALACTIC NUCLEI
Dumont, A., **Seth, A.**, [4 authors], 2020, *ApJ*, 888, 19.
- 27) IMPROVED DYNAMICAL CONSTRAINTS ON THE MASSES OF THE CENTRAL BLACK HOLES IN NEARBY LOW-MASS EARLY-TYPE GALACTIC NUCLEI AND THE FIRST BLACK HOLE DETERMINATION FOR NGC 205
Nguyen, D., **Seth, A.**, [18 authors], 2019, *ApJ*, 872, 104.
- 26) THE IMPACT OF STRIPPED NUCLEI ON THE SUPER-MASSIVE BLACK HOLE NUMBER DENSITY IN THE LOCAL UNIVERSE
Voggel, K., **Seth, A.**, [4 authors], 2019, *ApJ*, 971, 159.
- 25) NEARBY EARLY-TYPE GALACTIC NUCLEI AT HIGH RESOLUTION: DYNAMICAL BLACK HOLE AND NUCLEAR STAR CLUSTER MASS MEASUREMENTS
Nguyen, D., **Seth, A.**, [13 authors], 2018, *ApJ*, 858, 118.
- 24) THE BLACK HOLE IN THE MOST MASSIVE ULTRACOMPACT DWARF GALAXY M59-UCD3
Ahn, C., **Seth, A.**, [20 authors], 2018, *ApJ*, 858, 102.
- 23) UPPER LIMITS ON THE PRESENCE OF CENTRAL MASSIVE BLACK HOLES IN TWO ULTRA-COMPACT DWARF GALAXIES IN CENTAURUS A
Voggel, K., **Seth, A.**, [11 authors], 2018, *ApJ*, 858, 20.

- 22) DETECTION OF ENHANCED CENTRAL MASS-TO-LIGHT RATIOS IN LOW-MASS EARLY-TYPE GALAXIES: EVIDENCE FOR BLACK HOLES?
Pechetti, R., **Seth, A.**, [5 authors], 2017, *ApJ*, 850, 15.
- 21) PANCHROMATIC HUBBLE ANDROMEDA TREASURY. XVIII.
THE HIGH-MASS TRUNCATION OF THE STAR CLUSTER MASS FUNCTION
Johnson, L. C., **Seth, A.**, [8 authors], 2017, *ApJ*, 839, 78.
- 20) DETECTION OF SUPERMASSIVE BLACK HOLES IN TWO VIRGO
ULTRACOMPACT DWARF GALAXIES
Ahn, C., **Seth, A.**, [14 authors], 2017, *ApJ*, 839, 72.
- 19) IMPROVED DYNAMICAL CONSTRAINTS ON THE MASS OF THE
CENTRAL BLACK HOLE IN NGC 404
Nguyen, D., **Seth, A.**, [7 authors], 2017, *ApJ*, 836, 237.
- 18) PANCHROMATIC HUBBLE ANDROMEDA TREASURY. XVI.
STAR CLUSTER FORMATION EFFICIENCY AND THE CLUSTERED FRACTION OF YOUNG STARS
Johnson, L. C., **Seth, A.**, [11 authors], 2016, *ApJ*, 827, 33.
- 17) PANCHROMATIC HUBBLE ANDROMEDA TREASURY. XII.
MAPPING STELLAR METALLICITY DISTRIBUTIONS IN M31
Gregersen, D., **Seth, A.**, [12 authors], 2015, *AJ*, 150, 189.
- 16) MEASURING THE MASS OF THE CENTRAL BLACK HOLE IN THE
BULGELESS GALAXY NGC 4395 FROM GAS DYNAMICAL MODELING
den Brok, M., **Seth, A.**, [8 authors], 2015, *ApJ*, 809, 101.
- 15) PHAT STELLAR CLUSTER SURVEY. II. ANDROMEDA PROJECT CLUSTER CATALOG
Johnson, L. C., **Seth, A.**, [12 authors], 2015, *ApJ*, 802, 127.
- 14) MEASURING CONSISTENT MASSES FOR 25 MILKY WAY GLOBULAR CLUSTERS
Kimmig, B., **Seth, A.**, [3 authors], 2015, *AJ*, 149, 53.
- 13) A SUPERMASSIVE BLACK HOLE IN AN ULTRACOMPACT DWARF GALAXY
Seth, A., [13 authors], 2014, *Nature*, 513, 98.
- 12) EXTENDED STRUCTURE AND FATE OF THE NUCLEUS IN HENIZE 2-10
Nguyen, D., **Seth, A.**, [4 authors], 2014, *ApJ*, 794, 34.
- 11) PHAT STELLAR CLUSTER SURVEY I. YEAR 1 CATALOG AND INTEGRATED PHOTOMETRY
Johnson, L. C., **Seth, A.**, [22 authors], 2012, *ApJ* 752, 95.
- 10) THE ACS NEARBY GALAXY SURVEY TREASURY. X.
QUANTIFYING THE STAR CLUSTER FORMATION EFFICIENCY OF NEARBY DWARF GALAXIES
Cook, D., **Seth, A.**, [7 authors], 2012, *ApJ*, 751, 100.
- 9) GAS ACCRETION IN THE M32 NUCLEUS: PAST & PRESENT
Seth, A., 2010, *ApJ*, 725, 670.
- 8) THE NGC 404 NUCLEUS: STAR CLUSTER AND LIKELY INTERMEDIATE MASS BLACK HOLE
Seth, A., Cappellari, M., Neumayer, N., Caldwell, N., [7 authors], 2010, *ApJ*, 714 713.
- 7) THE ROTATING NUCLEAR STAR CLUSTER IN NGC 4244
Seth, A., Blum, R., [4 authors], 2008, *ApJ*, 687, 997.
- 6) THE COINCIDENCE OF NUCLEAR STAR CLUSTERS AND ACTIVE GALACTIC NUCLEI
Seth, A., Agueros, M., Lee, D., Basu-Zych, A., 2008 *ApJ*, 678, 116.

- 5) CLUES TO NUCLEAR STAR CLUSTER FORMATION FROM EDGE-ON SPIRALS
Seth, A., Dalcanton, J., Hodge, P., Debattista, V., 2006 *AJ*, 132, 2539.
- 4) A STUDY OF EDGE-ON GALAXIES WITH HST/ACS. II. VERTICAL DISTRIBUTION OF THE RESOLVED STELLAR POPULATION
Seth, A., Dalcanton, J., de Jong, S., 2005 *AJ*, 130, 1574.
- 3) A STUDY OF EDGE-ON GALAXIES WITH HST/ACS. I. INITIAL RESULTS
Seth, A., Dalcanton, J., de Jong, S., 2005 *AJ*, 129, 1331.
- 2) STAR CLUSTERS IN VIRGO AND FORNAX DWARF IRREGULAR GALAXIES
Seth, A., Olsen, K., Miller, B., Lotz, J., Telford, R., 2004 *AJ*, 127, 798.
- 1) WATER MASERS AS TRACERS OF PROTOSTELLAR DISKS AND OUTFLOWS IN THE INTERMEDIATE-MASS STAR-FORMING REGION NGC 2071
Seth, A., Greenhill, L., Holder, B., 2002 *ApJ*, 581, 325.

Additional co-authored papers available at this ADS listing.