

GRANT RUSSELL TREMBLAY

ASTROPHYSICIST
CENTER *for* ASTROPHYSICS | HARVARD & SMITHSONIAN
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EXPERIENCE

- 2017 *to present* **Astrophysicist** | Smithsonian Astrophysical Observatory (SAO)
Project Scientist | *Chandra X-ray Observatory* High Resolution Camera (HRC)
Lecturer of Astronomy | Harvard University Department of Astronomy
Deputy Lead | *Lynx X-ray Observatory* Concept Study at SAO
Center for Astrophysics | **Harvard & Smithsonian**, Cambridge, MA, USA
- 2014 *to* 2017 **NASA Einstein Fellow** | Yale Center *for* Astronomy & Astrophysics
Yale University, New Haven, CT, USA / Funding via NASA
- 2011 *to* 2014 **ESO Fellow** | Directorate *for* Science
European Southern Observatory (ESO), Garching bei München, Germany
- 2011 *to* 2014 **Fellow Astronomer** | Paranal Observatory Science Operations
ESO Paranal Observatory / Very Large Telescope, Cerro Paranal, Chile
- 2006 *to* 2008 **Graduate Research Assistant** | Science Mission Office
Space Telescope Science Institute (STScI), Baltimore, MD, USA

EDUCATION

- 2008 *to* 2011 **Ph.D. Astrophysics**
Rochester Institute of Technology, New York, USA

Doctoral Thesis advised by Prof. Christopher P. O’Dea and Prof. Stefi A. Baum:
“*Feedback Regulated Star Formation in Cool Core Clusters of Galaxies*”
- 2006 *to* 2008 Visiting Graduate Student (while doing Thesis work at STScI)
Johns Hopkins University, Maryland, USA
- 2002 *to* 2006 **B.S. Physics & Astronomy**
University of Rochester, New York, USA

RESEARCH

- Primary Interests* Star formation amid kinetic and radiative feedback from supermassive black holes
Galaxy clusters and their central galaxies, the intracluster medium
Galaxy formation, evolution, and dynamics
Space Policy and mission development (*Lynx X-ray Observatory*, Europa Lander)
- Techniques* Highly multiwavelength analysis including X-ray, ultraviolet, optical, and infrared
imaging and spectroscopy (*Chandra*, *HST*, *JWST*, *Spitzer*, *Herschel*, VLT, Keck,
Gemini etc.), as well as submillimeter and radio interferometry (ALMA, JVLA)

*Portfolio consists of more than 100 refereed publications (seventeen as first author, including in Nature),
three books for the general public, and over \$2.6M USD in funding (over \$858,000 as P.I.)*

LEADERSHIP EXPERIENCE

<i>AAS Leadership</i>	Senior Vice President (2024-2025) Vice President (2022-2024) Member, Board of Trustees Board Liaison, COMPASSE & HEAD Committees American Astronomical Society (AAS)
<i>NASA Leadership</i>	Vice Chair (2024 <i>to present</i>) Member (2022 <i>to present</i>) NASA Astrophysics Advisory Committee (APAC) <i>A FACA subcommittee of the NASA Advisory Council</i> Chair of the Executive Committee (2022-2024) Vice-Chair of the Executive Committee (2020-2021) X-ray Science Interest Group co-Chair (2020-2023) NASA Physics of the Cosmos Program Analysis Group (PhysPAG)
<i>Large Collaborations</i>	Lynx X-ray Observatory NASA Large Mission Concept Study www.lynxobservatory.org Deputy Lead for <i>Lynx</i> at SAO Head of the <i>Lynx</i> Science Support Office Member of the <i>Lynx</i> Study Office Branding, Graphic Design, and Website Lead The Close AGN Reference Survey (CARS) Founding Member & Former P.I. www.cars-survey.org CARS is now a legacy-class MUSE, ALMA, <i>HST</i> & <i>Chandra</i> dataset that has enabled dozens of papers & five PhD Theses
<i>Research Group Leadership</i>	Leader of an SAO research group that has included three Postdocs (Dr. Rebecca Nevin , Dr. Bryan Terrazas , Dr. Razieh Emami), two Ph.D. students (Osase Omoruyi & Aimee Schechter), and five undergraduates. Center for Astrophysics Harvard & Smithsonian (2019 <i>to present</i>)

GRANTS & AWARDS

<i>Telescope Time as Principal Investigator (selected)</i>	James Webb Space Telescope Cycle 2 (2023): <i>A Galaxy-Scale Fountain of Multiphase Gas Pumped by a Black Hole: The power of JWST combined with ALMA, MUSE, Chandra, and HST</i> GO Program 4094, P.I.: G. Tremblay, allocated 12 hours and \$93,307 Chandra X-ray Observatory Cycle 24 (2022): <i>A Supermassive Black Hole Binary in a Changing-look Quasar</i> GO Program 24700175, P.I.: G. Tremblay, allocated 300 ksec and \$88,110 Hubble Space Telescope Cycle 28 (2020): <i>Temporal & Spatial Resolution of Stellar Ages amid Quasar-Driven gas flows</i> GO Program 16173, P.I.: G. Tremblay, allocated 33 orbits and \$124,575
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Chandra X-ray Observatory Large Program Cycle 18 (2016):
The Hot Phase of a Cold Black Hole Fountain: Unifying Chandra with ALMA
Large Program 18800649, **P.I.: G. Tremblay, allocated 480 ksec and \$160,360**

Atacama Large Millimeter/submillimeter Array (ALMA) Cycle 4 (2016):
Resolving Molecular Outflows in nearby Luminous AGN from the CARS Survey
Project Code 2016.1.00952.S, **P.I.: G. Tremblay, Ranked High Priority**

Chandra X-ray Observatory Cycle 17 Director's Discretionary Time (2014):
Catching a Changing Look Quasar as it returns to the Shadows for the Second Time
DDT Program 17708536, **P.I.: G. Tremblay, allocated 30 ksec**

Chandra X-ray Observatory Cycle 17 (2015):
Expanding Superbubbles in Luminous AGN: Unifying Chandra with MUSE
GO Program 177005179, **P.I.: G. Tremblay, allocated 200 ksec and \$81,272 USD**

Atacama Large Millimeter/submillimeter Array (ALMA) Cycle 3 (2015):
Beaded Strings of Young Stellar Superclusters between Merging Elliptical Galaxies
Project Code 2015.1.01426.S, **P.I.: G. Tremblay, Ranked High Priority**

Atacama Large Millimeter/submillimeter Array (ALMA) Cycle 1 (2013):
The Cold Phase of a Hot Mode: Filaments & Feedback in Abell 2597
Project Code 2012.1.00988.S, **P.I.: G. Tremblay, Ranked Highest Priority**

Chandra X-ray Observatory Cycle 16 (2014):
A "String of Pearls" between two Merging Elliptical Galaxies
GO Program 17218, **Sci. P.I.: G. Tremblay, allocated 130 ksec and \$53,406 USD**

Hubble Space Telescope Cycle 21 (2013):
Ghost Ionization in Cooling Flow Filaments: A Test with Deep FUV Spectroscopy
GO Program 13304, **P.I.: G. Tremblay, allocated 23 Orbits and \$64,917 USD**

Very Large Telescope, Gemini, Keck, Palomar 200", WIYN, Blanco, & SOAR
Fifteen programs as P.I. (Imaging, Spectroscopy, & IFU spectroscopy, incl. Laser AO)

Research Fellowships

Einstein Fellowship

NASA Prize Fellowship | *Now part of the NASA Hubble Fellowship Program*
Hosted at Yale University, 2014 to 2017
Fellowship sponsor/mentor: Prof. C. Megan Urry

European Southern Observatory (ESO) Fellowship

Independent Postdoctoral Fellowship | ESO Garching, 2011 to 2014

Other Funding

Center for Astrophysics | Harvard & Smithsonian Director's Office | **\$100K**
Smithsonian Institution Scholarly Studies Grant (2021) | **\$60K**
CfA IR&D funding for the *Lynx X-ray Observatory* Concept Study | **\$750K**
NRAO ALMA Ambassadors Program (2017) | **\$10K**
New York Space Grant Consortium | **\$10K**

*Selected Programs
as Co-Investigator*

- *JWST* Cycle 3 Projects 5354, 5018
- *JWST* Cycle 2 Projects 4094, 4065, 3149
- Co-I on 25 accepted ALMA programs between Cycles 0 and 9, including:
- ALMA Cycle 4 Projects 2016.1.(01075 / 01058 / 01214).S, Various P.I.s
- ALMA Cycle 3 Projects 2015.1.(01198 / 01107 / 00627 / 00623).S, Various P.I.s
- ALMA Cycle 2 Project 2013.1.00862.S, P.I.: A. Simionescu
- ALMA Cycle 1 Project 2012.1.00837.S, P.I.: B. McNamara
- ALMA Cycle 0 Project 2011.0.00374.S, P.I.: B. McNamara
- *HST* Cycle 24 DDT Program 14486, P.I.: B. Husemann
- *HST* Cycle 22 GO Program 13638, P.I.: M. Bayliss
- *HST* Cycle 21 GO Program 13422, P.I.: R. Canning
- ALMA Cycle 4 Projects 2016.1.(01075 / 01058 / 01214).S, Various P.I.s
- *HST* Cycle 24 DDT Program 14486, P.I.: B. Husemann
- *HST* Cycle 22 GO Program 13638, P.I.: M. Bayliss
- *HST* Cycle 21 GO Program 13422, P.I.: R. Canning
- *HST* Cycle 20 GO Program 13023, P.I.: M. Chiaberge
- *HST* Cycle 18 GO Program 12220, P.I.: R. Mittal
- *Chandra* Cycle 17 GO Program 17700006, P.I.: Massaro, 192 ksec
- *Chandra* Cycle 15 GO Program 15700111, P.I.: Massaro, 276 ksec
- *XMM-Newton* AO-13 Program 074434, P.I.: J. Sanders
- Gemini Program GN-2014A-Q-55, P.I.: O'Dea / Tremblay, 6 hr
- Jansky Very Large Array: 2012B Program 12B-289, P.I.: T. Clarke
- Very Large Telescope Period 86 Program 086.A-0399, P.I.: M. Chiaberge
- *Various (more than 20) other programs on ground- and space-based telescopes*

Awards & Honors

NASA Silver Group Achievement Award

For recovering *Chandra's* High Resolution Camera from anomalies in 2020 & 2022

NASA Group Achievement Awards

For the *Chandra* 20th Anniversary Communications Team, 2021

For the *Lynx X-ray Observatory* Concept Study, 2019

Smithsonian Institution Special Achievement Awards

Three awards for *Lynx*, *Light from the Void*, and the HRC Anomaly of 2020

Stoddard Prize

Best thesis in Physics & Astronomy, University of Rochester, 2006

Undergraduate Research Prize

Astronomical Society of New York, 2006

Undergraduate Teaching Prize

Outstanding Teaching in Physics & Astronomy, University of Rochester, 2006

Sigma Pi Sigma

Physics Honor Society

Graduation with High Honors

Graduate, Undergraduate, & Secondary Schools, 2002 to 2011

Ph.D. Students
(official)

Osase Omoruyi, Harvard University | Ph.D. Astronomy expected May 2025
Awarded NSF Graduate Research Fellowship, 2021
Awarded ALMA SOS Fellowship, 2023

Meredith Powell, Yale University | Ph.D. Astrophysics (completed May 2019)
Thesis Project: *Expanding Superbubbles in Luminous AGN*
co-supervised with Prof. C. Megan Urry
Now a Schwarzschild Fellow at AIP Postdam, formerly a Porat Fellow at Stanford

Invited Visiting
Professorship

“You Can’t Grow a Black Hole for Free”
Invited lecture series given as Visiting Professor
Universidad Nacional Autónoma de México (UNAM), Mexico, November 2014

Other Teaching

Harvard University, Lecturer of Astronomy
Lectureship appointment was in order to formally supervise Harvard Ph.D. Students
(2021 *to present*)

Harvard University | Banneker & Aztlán Institute, Advisor
Research Advisor and Instructor for this ten-week summer research experience created to prepare talented undergraduate students of color and other underrepresented groups for studies in top graduate programs in astronomy.

Yale University, Guest Lecturer
Planned and led lectures for 10+ undergraduate astronomy/physics courses.

Teaching Assistant, Dept. of Physics, Rochester Institute of Technology
Physics I (Winter 2008), II (Spring 2009), & III (Fall 2008)
Included planning & leading full lectures

Teaching Intern, Dept. of Physics & Astronomy, University of Rochester
Elementary Astronomy (Fall 2003), Elementary Astrophysics (Spring 2004), Black Holes & Time Warps (Fall 2004 & 2005), Intro. Mechanics (Spring 2005 & 2006)
Awarded U. of Rochester Prize for Outstanding Undergraduate Teaching

Other Students
Supervised

Kevin Ortiz Ceballos, Banneker Institute Student (now at Harvard)
Sideena Grace, 2020 Banneker Institute Student (now at MIT)
Keduse Worku & Kevin Ortiz Ceballos, 2019 Banneker Institute Students
Daniel Rodriguez, 2018 Banneker Institute Student
William Cramer, Yale Ph.D. Student
Tonima Tasnim Ananna, Yale Ph.D. Student
Dominic Eggerman & Nathaniel Kerman, Yale Undergraduates
“Fellow Mentor” for two ESO Ph.D. Students
K. Cooke, RIT Ph.D. student, 2014 *to* 2016
K. Christiansen, RIT Undergraduate, 2010 *to* 2011
B. Litts, High School Student, 2011
K. O’Dea, REU Student, 2010 (resulted in publication with undergrad. as first author)
Several Students in the RIT Insight Lab Summer Program, 2008 *to* 2010

TECHNICAL EXPERIENCE

<i>Professional Telescope Experience</i>	Chandra High Resolution Camera Project Scientist, Instrument P. I. Team Official SAO duties. Responsible for operations and science analysis of <i>Chandra X-ray Observatory</i> 's High Resolution Camera (HRC), as part of the Instrument Principal Investigator team. Operational responsibilities include reviewing <i>Chandra</i> command loads to ensure safe operation of the flight instrument, monitoring its health and safety, and analyzing in-flight calibration data. Includes extensive experience in commanding, intervention, and spacecraft recovery procedures. Experience includes major roles in recovery from critical spacecraft anomalies in 2020 and 2022, an effort which was awarded a NASA Silver Group Achievement Award Support Astronomer Very Large Telescope (Unit Telescope 2 / Kueyen) Official ESO duties, 40 nights per year. In charge of the science operation of the telescope including the XSHOOTER, UVES, and FLAMES spectrographs, quality assessment of the data, and the support of visiting astronomers.
<i>Space-based Telescopes</i>	James Webb Space Telescope Growing experience (successfully proposing, obs. planning, reduction of data) Hubble Space Telescope Extensive experience (successfully proposing, obs. planning, reduction of data) Chandra X-ray Observatory Extensive experience (successfully proposing, obs. planning, reduction of data) X-ray Multi-Mirror Mission (XMM-Newton) Substantial experience (successfully proposing, reduction of data) Spitzer Space Telescope Substantial experience (proposing, obs. planning, reduction of data) Herschel Space Observatory Limited experience (reduction & analysis of data)
<i>Ground-based Telescopes</i>	Atacama Large Millimeter/submillimeter Array (ALMA) Extensive experience (successfully proposing, obs. planning, data reduction) Very Large Telescope Extensive / direct experience (operations, observation planning, data reduction) Very Large Array Some experience (successfully proposing, limited data reduction) Other Telescopes Many nights of observing (on-mountain and remote) with the VLT, Keck, Gemini, SOAR 4.1m, Palomar 200", WIYN 3.5m, UKIRT, NASA IRTF, & TNG
<i>Computing skills</i>	Programming: Python (fluent), IDL, C/C++, regex, shell scripting, etc. Codes available at: https://github.com/granttremblay Formal member of the Astropy team Deputy lead for www.astropy.org Analysis: Astropy, AstroConda / DrizzlePac, (Py/I)RAF including STSDAS & NOAO packages, etc., CIAO, XSPEC, Sherpa, MOPEX, HIPE, CASA, DS9 Presentation: L ^A T _E X, Matplotlib, Adobe products (nearly all), SuperMongo OS: Linux, macOS, Unix, Solaris, Windows

*Multiwavelength
Analysis Experience*

X-ray: Spectral fitting (*Chandra* and *XMM* data), quantitative imaging analysis, spatially resolved spectroscopy techniques (i.e., X-ray spectral maps, deprojection), X-ray time domain analysis.

Ultraviolet: FUV diagnostic spectroscopy (with *HST/COS*), FUV and NUV imaging (*HST/ACS* SBC and STIS).

Optical: Extensive experience with space- and ground-based imaging data (especially *HST*), photometry, observational techniques, optical spectroscopy (e.g., XSHOOTER, UVES), integral field spectroscopy (e.g., SINFONI, GMOS, OSIRIS).

Mid/Far-infrared *Spitzer* MIPS and IRAC photometry, *Herschel* PACS spatially resolved spectroscopy.

Sub-mm & Radio Quantitative analysis of ALMA data in CASA, analysis of Very Large Array Radio data.

SERVICE & MEMBERSHIPS

*Space Mission
Development*

**Deputy Lead for SAO | Lynx X-ray Observatory NASA Strategic Mission Study
Head of the Lynx Science Support Office**

Core Member of the *Lynx* Study Office

Creator / web designer and curator of www.lynxobservatory.org

Lynx Graphic Design Lead (portfolio at www.behance.net/granttremblay)

Member of the Communication, ‘Feedback’, and ‘Synergy’ Working Groups

Core Science Team | Europa X-ray Instrument for Life Exploration (EXILE)

An X-ray Silicon Drift Detector for the notional Europa Lander Mission

Committee Service

XRSIG co-chair, NASA PhysPAG Executive Committee (2019 *to present*)

Member, NASA Great Observatories Science Advisory Group (2018 *to* 2019)

AAS Agent for Yale University (<http://aas.org/agents/>)

Very Large Telescope / Unit Telescope 2 (Kueyen) SciOps Team

Fellow Contact, ESO Directorate for Science (2012 *to* 2014)

ESO Observing Programmes Committee, Periods 93, 91, 90, 89 (*Scientific Assistant*)

ESO User’s Committee 2013 Meeting (*Fellow Assistant*)

ESO Scientific & Technical Committee 2011 Meeting (*Fellow Assistant*)

International Search Committee, Dean of the College of Science for RIT (2011)

Society of Physics Students Exec. Committee, University of Rochester (2004 *to* 2006)

*Colloquia Series
Created*

Founder & Organizer, “The AGN Club”

2011 *to present*, ESO & MPA/MPE

Highly popular regular meeting of the local AGN community, the first of its kind.

Founder & Organizer, “Extragalactic Lunch”

2007 *to* 2008, Space Telescope Science Institute

<i>Meetings Organized</i>	<p>“The Second Kathmandu Astrophysics School”, Pokhara, Nepal, June 2018 (SOC)</p> <p>“ALMA Community Days 2017”, New Haven, CT USA, April 2017 (Co-creator)</p> <p>“SciCoder 2016”, New Haven, CT USA, August 2016 (LOC)</p> <p>“Large Scale Clustering of Active Galactic Nuclei”, Garching, July 2014 (LOC)</p> <p>“AGN 101: A Review of the Field”, Garching, May 2013 (Co-creator / SOC)</p> <p>“Shaping E-ELT Science and Instrumentation, Ismaning, Germany, Feb 2013 (LOC)</p> <p>“Islands in the Cosmos”, Garching, Nov. 2012 (Co-creator / SOC)</p> <p>“ESO@50: The First Fifty Years of ESO”, Garching, Sept. 2012 (LOC)</p> <p>“Star Formation Across the Universe”, Garching, Dec. 2011 (Co-creator / SOC)</p>
<i>Other Colloquia Organized</i>	<p>Yale Center for Astronomy & Astrophysics Seminar, 2015 to 2016</p> <p>Yale Astronomy Colloquium, 2014 to 2015</p> <p>The ESO Journal Club, 2011 to 2014</p> <p>Various ESO Talks, 2011 to 2014</p> <p>The RIT Astronomy Journal Club, 2008 to 2010</p> <p>RIT Astronomy Lunch Talks, 2008 to 2010</p>
<i>Referee for</i>	<p><i>Nature</i></p> <p><i>The Astrophysical Journal</i></p> <p><i>Monthly Notices of the Royal Astronomical Society</i></p> <p><i>Astronomy & Astrophysics</i></p> <p>ESO Director’s Discretionary Time Proposals (<i>technical assessment</i>)</p> <p>NASA Postdoctoral Program (NPP) Proposals</p> <p>Harvard University Senior Theses</p>
<i>Proposal Review Panel Service</i>	<p>NASA 2020 E.7 <i>Support for Open Source Tools</i> Review Panel (2021)</p> <p><i>James Webb Space Telescope</i> Cycle 1 Time Allocation Committee (2021)</p> <p>Center for Astrophysics Internal Time Allocation Commieeee, 2019 to present</p> <p>Chair, <i>Chandra</i> Cool Attitude Targets (CAT) Extragalactic Committee, 2018</p> <p><i>Hubble Space Telescope</i> Cycle 25 Time Allocation Committee, 2017</p> <p>ALMA Strategic Studies Development Program, 2017</p> <p>ALMA Cycle 4, 5, and 6 Proposal Review Committee, 2016-2019</p> <p><i>Chandra</i> Cycle 17 Time Allocation Committee, 2015</p> <p>NASA Earth & Space Science Fellowship Review Committee, 2015</p> <p>NASA Astrophysics Data Analysis Program Review Committee, 2015 & 2016</p> <p>Yale Time Allocation Committee, 2016A, 2016B, & 2017A</p>
<i>Society Memberships</i>	<p>American Astronomical Society Vice President (2022-2025), Full Member</p> <p>Royal Astronomical Society Fellow</p> <p>International Astronomical Union Full Member</p>

PRESS & PUBLIC OUTREACH

<i>Press Releases on First-Author Papers</i>	<p>November 2018 “ALMA and MUSE Detect Galactic Fountain”</p> <p>Press releases from NASA/Chandra, ESO, NRAO/ALMA, Yale (and others) on Tremblay <i>et al.</i> 2018, including an “ESOCast” video. The release was picked up by more than thirty Print and Web news outlets in multiple languages including <i>CNN</i>, <i>Space.com</i>, <i>SyFy Wire</i>, etc.</p>
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June 2016 | **“Black Hole Deluged by Cold Intergalactic Rain”**

Press releases from **Nature, NRAO/ALMA, ESO, Yale, MIT** (and others) on Tremblay *et al.* 2016, *Nature*. Picked up by over three hundred Print and Web news outlets in over fifteen languages, including *The New York Times*, the *BBC*, *The Washington Post*, *TIME*, *Astronomy*, *Popular Science*, *Wired*, and *Discover* Magazines, as well as many others. The paper has an Altmetric score in the 99th percentile of all tracked papers, and in the 93rd percentile of all similarly aged *Nature* papers.

August 2015 | **“Galaxy Star Birth Regulated by Black Hole Fountain”**

Press releases from **NASA/STScI, ESA, & Yale University** on Tremblay *et al.* 2015. Picked up by over fifty Print and Web news outlets in over ten languages including *IFL Science*, *Astronomy Magazine*, & *Russia Today*.

July 2014 | **“Hubble Sees Bridge of Young Stars Between Two Ancient Galaxies”**

Press releases from **NASA/STScI, ESA, & Hubble Heritage** on Tremblay *et al.* 2014 including a “Hubblecast” video (Hubblecast # 76) and “Hubble Hangout” webcast. Release was picked up by over fifty Print and Web news outlets in over ten languages including *NBC News*, *The Huffington Post*, *Astronomy Picture of the Day*, *Discover & Astronomy* Magazines, *Space.com*, *la Repubblica*, *El Mercurio*, *Kronen Zeitung*, etc.

*External Affairs
& Government
Relations Experience*

2011 to 2014, **representing the European Southern Observatory (ESO)** | Appointed by the ESO Director General to help represent the organization in meetings with and visits by the **President of the European Commission** (J. Barroso, 2014), the **President of Chile** (S. Piñera, 2014), the **European Union’s High Representative Foreign Affairs** (C. Ashton, 2014), the **Prime Minister of Sweden** (C. Bildt, 2014), the **German Science Minister**, and the **Brazilian Ambassador to Germany**. Selected based on ability to engage with stakeholders in an engaging, enthusiastic way while being able to safeguard the organization’s interests, stay on message, and strengthen ESO’s status as an engine of scientific leadership in Europe and Chile.

2017 to present, **representing the CfA and Smithsonian** | Various events formally or informally representing the CfA’s interests, including multi-day 1:1 meetings with the **NASA Administrator** (J. Bridenstine) and **NASA SMD Associate Administrator** (T. Zurbuchen), several Donor events, etc. Chosen by the CfA Director (C. Alcock) to lead the Smithsonian’s *Space On the Hill* series. Working with Undersecretary Ellen Stofan, helped lead the CfA’s government relations efforts for the Event Horizon Telescope Sgr A* event, including recruiting three White House officials to the event. Multiple presentations to the SAO Advisory Board, led *Chandra* OCC tours for VIPs, etc. Selected by the Smithsonian Office of Government Relations to conduct an on-camera interview with Rep. Joe Morelle (D-NY 25).

2022 to present, **representing the American Astronomical Society** | As Vice President, represented the AAS and its membership at the U.S.-Africa Leaders summit (Washington, DC, December 2022), sponsored by the White House and the U.S. Department of State. Led negotiations in what resulted in a formal set of Resolutions between the African Astronomical Society (AfAS), the International Astronomical Union (IAU), and the AAS in the lead up to the 2024 IAU General Assembly.

*Education &
Public Outreach
(Highlights)*

Frequent guest commenting on space-related issues on *NBC Nightly News with Lester Holt*, the *TODAY Show*, *NPR Science Friday*, *NPR All Things Considered*, *Boston 25 News*, various Podcast episodes including *Planetary Radio*, etc.

Appearances on over 45 episodes of television documentary series, full credits at <https://www.imdb.com/name/nm8955325/>. Highlights include:

Discovery Channel Documentary Series | “*How the Universe Works*”
Prime cast member on seasons 6-11, with more forthcoming

Science Channel Documentary Series | “*Space’s Deepest Secrets*”
Prime cast member for Seasons 3, 4, 5
Season 2, Episode 5 includes segment about results from Tremblay et al. 2016, Nature

BBC & PBS NOVA Series | “*Universe*” (2022), “*Great American Eclipse*” (2024)
Prime cast member

Space on the Hill, Lead Organizer (2020 to present)
An outreach program for members of the U.S. Senate and House of Representatives (and their staffers), held every other month in the House Science Committee’s room.
Co-sponsored by the Smithsonian and the American Astronomical Society.

Astronomy On Tap, Lead Organizer (Connecticut chapter)
Highly popular monthly outreach event at a local pub, now in 12 cities worldwide
<http://astronomyontap.org/> | <http://www.facebook.com/AstronomyOnTap/>

Awesome Con 2017 | Official Guest
Moderated a Q&A on Space and Time with David Tennant (Dr. Who) before a live audience of 5,000 people | <http://awesome-con.com/guests/>

Profiled by **BBC Sky at Night Magazine**
November 2015 Issue, <http://www.skyatnightmagazine.com/>

*Education &
Public Outreach
(other / selected)*

- Public talk for 300 middle school students in Belfast, Maine
- Hosted *White House Astronomy Night* Satellite Event, New Haven, 2015
- Several events for Leitner Family Observatory & Planetarium, New Haven
- ESO Outreach Ambassador, 2011 to 2014
- “*Ask an Astronomer*”, ESO Open House Day, Garching, 2013
- ALMA outreach media event at high site (ALMA AOS, 2013)
- Diplomatic outreach with Foreign Dignitaries (ESO 50th Anniversary Gala, 2012)
- “*Letters from the Edge of the Universe*”, ESO Open House Day, Garching, 2011
- Girl Scout Astronomy Nights & Family Science Nights, RIT, 2008 to 2011
- Co-organized multiple “open telescope” nights at RIT Observatory, 2008 to 2011
- Johns Hopkins Dept. of Physics & Astro. Annual Physics Fair, 2007
- “*Big Explosions & Strong Gravity*”, NASA Goddard Space Flight Center, 2008
- “*Ask a Scientist*” at NASA’s *JWST* Exhibit, National Mall, Washington D.C. (2007)
- Mees Observatory Tour Guide, 2005 to 2006
- Chair, American Phys. Society Educational Outreach Committee, Rochester, 2005

*Invited Talks
& Reviews
(selected)*

- *Dozens of Invited Departmental Colloquia:* Dartmouth | CfA | UMass Amherst | U. Michigan | RIT | U. Alabama | Wesleyan | Yale | UMBC | STScI | ASTRON etc.
- *“The Sky & Other Ghosts: Our Fading Age of Discovery”*
14th Annual Biard Endowed Lectureship, Ohio State University, 2024
- Several Invited Virtual talks in the COVID era (2020-2023), including STScI Spring Symposium, Diffuse Gas in Cosmic Ecosystems, Beijing HUBS Symposium, etc.
- *“Cold, Galaxy-scale Fountains with Black Hole Pumps”*
Meeting of the Canadian Astronomical Society (CASCAS), Winnipeg, Canada, 2016
- *“A Galaxy-Scale Fountain of Cold Molecular Gas Pumped by a Black Hole”*
Sweeping Galaxies Clean with Molecular Outflows, Sesto, Italy, 2016
- *“The Cold Phase of Mechanical AGN Feedback”*
Snowcluster 2015: The Physics of Galaxy Clusters, Snowbird, Utah, 2015
- *“Galaxy Growth from the Collapse of Hot Atmospheres”*
Islands in the Cosmos: Views of Galaxy Formation, Garching, Germany, 2013
- *“Kinetic and Radiative Feedback from Active Galaxies”*
“AGN 101”: A Review of the Field, Garching, Germany, 2013
- *“Star Formation amid Mechanical AGN Feedback in Brightest Cluster Galaxies”*
Astronomical Society of New York Spring Meeting, Rochester, NY, USA, 2011
- ASNY Research Prize Talk: *“The Warped Nuclear Disk of Radio Galaxy 3C 449”*
Astronomical Society of New York Fall Meeting, Troy, NY, USA, 2006

*Contributed Talks
(selected)*

- *“A Galaxy-Scale Fountain of Cold Molecular Gas Pumped by a Black Hole”*
Extragalactic Relativistic Jets: Cause & Effect, Bangalore, India, 2015
- *“A Galaxy-Scale Fountain of Cold Molecular Gas Pumped by a Black Hole”*
Revolution in Astronomy with ALMA: The Third Year, Tokyo, Japan, 2014
- *“Ballistic Molecular Rain powers Cold Black Hole Feedback”*
IAUS 313, Extragalactic Jets at Every Angle, Puerto Ayora, Galápagos, 2014
- *“ALMA views on Star Formation and AGN Feedback in Radio Loud AGN”*
IAUS 304, Multiwavelength AGN Surveys & Studies, Yerevan, Armenia, 2013
- *“Cool Core Clusters can Actually Cool”*
Tracing Cosmic Evolution with Clusters of Galaxies, Sesto, Italy, 2013
- *“Star Formation, Feedback, and Cold Molecular Gas in BCGs”*
Feeding, Feedback, & Fireworks (Southern Cross), Hamilton Island, Australia, 2013
- *“Morphology of Star Forming Filaments in Elliptical Galaxies”*
ESO Science Day, Garching, Germany, 2013
- *“Unique Multiphase Signatures of AGN Feedback in Abell 2597”*
IAU General Assembly XXVIII, Beijing, China, 2012
- *“Episodic Star Formation coupled to Reignition of Radio Activity in 3C 236”*
Powerful Radio Galaxies: Triggering & Feedback, Leiden, The Netherlands, 2009

Other Presentations

Many formal and informal talks (30+) at various institutes
Various Contributed Posters (four AAS meetings, two AGN feedback meetings, etc.)
Invited talks to data reduction tutorials (X-ray, optical data, etc.)

OTHER INFORMATION

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References

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Science Impact Reviewers

The following people submitted letters in support of my recent (2020) promotion at the Smithsonian Astrophysical Observatory: **Prof. Feryal Özel**, **Prof. Megan Donahue**, **Prof. Mark Voit**, **Prof. Brian McNamara**, and **Prof. Andy Fabian**.

REFEREED PUBLICATIONS

Over 100 publications, seventeen as first author, including in Nature. Papers in preparation are not listed. Solid and dashed underlines mark graduate and undergraduate authors under my supervision, respectively.

Highlighted papers (i.e., first author papers or works on which I was significantly involved at all stages)

1. Bogdán, Á., Goulding, A. D., Natarajan, P., Kovács, O. E., **Tremblay, G. R.**, Chadayammuri, U., Volonteri, M., Kraft, R. P., Forman, W. R., Jones, C., Churazov, E., & Zhuravleva, I., *Evidence for a heavy-seed origin of early supermassive black holes from a $z \approx 10$ X-ray Quasar*, **Nature Astronomy**, 8, 126 (2024)
2. Omoruyi, O., **Tremblay, G. R.**, Combes, F., Davis, T. A., Gladders, M. D., Vikhlinin, A., Nulsen, P., Zuhone, J. A., Baum, S. A., O'Dea, C. P., Sharon, K., Terrazas, B. A., Nevin, R., Schechter, A., McDonald, M., Dahle, H., Bayliss, M., Connor, T., Florian, M., Rigby, J. R., & Vaddi, S., “*Unraveling the Origin and Multiphase*

Dynamics of a ‘Beads on a String’ Star Formation Complex in a Cool Core Cluster with Merging Central Galaxies”, **ApJ**, 963, 1 (2023)

3. Rose, T., McNamara, B. R., Combes, F., Edge, A. C., Fabian, A. C., Gaspari, M., Russell, H. R., Salomé, P., **Tremblay, G. R.**, & Ferland, G., “*Does absorption against AGN reveal supermassive black hole accretion?*”, **MNRAS**, 518, 878 (2023)
4. Speranza, G., Balmaverde, B., Capetti, A., Massaro, F., **Tremblay, G. R.**, Marconi, A., Venturi, G., Chieraberge, M., Baldi, R. D., Baum, S., Grandi, P., Meyer, E. T., O’Dea, C., Sparks, W., Terrazas, B. A., Torresi, E., “*The MURALES survey. IV. Searching for nuclear outflows in 3C radio galaxies at $z < 0.3$ with MUSE observations*”, **A&A**, 653, 150 (2021)
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7. Vaddi, S., **Tremblay, G. R.**, O’Dea, C. P., Chakravorty, S., Kharb, P., Baum, S. A., McDonald, M., & Donahue, M., “*HST/COS Spectroscopy of Cooling Flow Filaments in Abell 2597 and Zw3146*”, submitted to **ApJ** (2020)
8. Gaskin, J., Swartz, D. A., Vikhlinin, A., Özel, F., Gelmis, K., Arenberg, J. W., Bandler, S. R., Bautz, M. W., Civitani, M. M., Dominguez, A., Eckart, M. E., Falcone, A. D., Figueroa-Feliciano, E., Freeman, M. D., Günther, Hans M., Havey, K. A., Heilmann, R. K., Kilaru, K., Kraft, R. P., McCarley, K. S., McEntaffer, R. L., Paresci, G., Purcell, W., Reid, P. B., Schattenburg, M. L., Schwartz, D. A., Schwartz, E. D., Tananbaum, H. D., **Tremblay, G. R.**, Zhang, W. W., & Zuhone, J. A., “*Lynx X-ray Observatory: An Overview*”, **JATIS**, 5(2), 021001 (2019)
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4. Levesque, E. M., Bezanson, R., & **Tremblay, G. R.**, “Why Astronomy Programs are moving on from the Physics GRE”, Editorial in *Physics Today* (2017), DOI:10.1063/PT.5.9090
5. **Tremblay, G. R.**, “Black Hole Feedback is Elegant, not Violent”, Einstein Fellows Symposium (2016)
6. Muna, D. and 137 co-signers including **Tremblay, G. R.**, “The Astropy Problem”, arXiv:1610.03159 (2016)

7. Rice, E. L. et al. including **Tremblay, G. R.**, “*Expanding the Universe of ‘Astronomy on Tap’ Public Outreach Events*”, American Astronomical Society, AAS Meeting #227 (2016)
8. **Tremblay, G. R.**, “*ALMA Reveals a Galaxy-Scale Fountain of Cold Molecular Gas Pumped by a Black Hole*”, American Astronomical Society, AAS Meeting #227 (2016)
9. Levesque, E. M., Bezanson, R., & **Tremblay, G. R.**, “*Physics GRE Scores of Prize Postdoctoral Fellows in Astronomy*”, arXiv:1512.03709 (2015)
Note: This paper presents results from our survey regarding use of the Physics Graduate Record Examination (GRE) in graduate admissions. The paper was specifically cited as a motivating factor behind a formal recommendation by the AAS council, and was widely shared in many departments, an AAS presidential post, and highlighted in many blogs.
10. **Tremblay, G. R.**, “*A Galaxy-Scale Fountain of Cold Molecular Gas Pumped by a Black Hole*”, Einstein Fellows Symposium (2015)
11. Rothberg, B. et al. including **Tremblay, G. R.**, “*The Close AGN Reference Survey*”, IAU General Assembly, Meeting #29 (2015)
12. **Tremblay, G. R.**, “*Star Formation amid Kinetic Black Hole Feedback*”, Einstein Fellows Symposium (2014)
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15. **Tremblay, G. R.** “*Fellows at ESO*”, The Messenger, 151, 63 (2013)
16. **Tremblay, G. R.** “*HST Ultraviolet Observations of Star Formation in Seven Brightest Cluster Galaxies in Cooling Flows*”, Galaxy Clusters: Observations, Physics and Cosmology, 41P (2010)
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18. **Tremblay, G. R.**, Chiaberge, M., Donzelli, C. J., Sparks, W. B., Quillen, A. C. “*Dust Lanes, Nuclear Dusty Disks, and Isophotal Properties as Observed by HST: What Do They Tell Us about the 3-D Structure of Elliptical Radio Galaxy Hosts?*”, Bulletin of the American Astronomical Society, 38, 987 (2008)
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MAJOR COMMUNITY REPORTS

1. **Lynx X-ray Observatory Concept Study Report**

Available at www.lynxobservatory.org/report, released August 2019

Significant involvement at all levels, including editorial control over the Science Section, writing many pages of text, and creating the large majority of science figures throughout the report

2. **Great Observatories: The Past and Future of Panchromatic Astrophysics**

Available at www.greatobservatories.org, released January 2020

Consensus report of the NASA Great Observatories Science Analysis Group (SAG-10)

Significant involvement across several sections of the report, including on major figures.

1. **Tremblay, G. R.** et al., “*Galaxy Winds in the Age of Hyperdimensional Astrophysics*”, **BAAS**, 51, 480 (2019)
2. Civano, F. et al., “*Cosmic evolution of supermassive black holes: A view into the next two decades*”, **BAAS**, 51, 429 (2019)
3. Voit, M. et al., “*Circumgalactic Gas and the Precipitation Limit*”, **BAAS**, 51, 405 (2019)
4. Peebles, M. et al., “*Understanding the circumgalactic medium is critical for understanding galaxy evolution*”, **BAAS**, 51, 386 (2019)
5. Siemiginowska, A. et al., “*The Next Decade of Astroinformatics and Astrostatistics*”, **BAAS**, 51, 355 (2019)
6. Oppenheimer, B. et al., “*Imprint of Drivers of Galaxy Formation in the Circumgalactic Medium*”, **BAAS**, 51, 280 (2019)
7. Walker, S. et al., “*Unveiling the Galaxy Cluster - Cosmic Web Connection with X-ray observations in the Next Decade*”, **BAAS**, 51, 218 (2019)
8. Bulbul, E. et al., “*Probing Macro-Scale Gas Motions and Turbulence in Diffuse Cosmic Plasmas*”, **BAAS**, 51, 210 (2019)
9. Pacucci, F. et al., “*Detecting the Birth of Supermassive Black Holes Formed from Heavy Seeds*”, **BAAS**, 51, 117 (2019)

BOOKS FOR THE GENERAL PUBLIC

1. **Tremblay, G. R.**, *The Sky & Other Ghosts: Our Fading Age of Discovery* (working title), a forthcoming 350 page book on the history of NASA’s Great Observatories, coming 2025 from Princeton Press
2. Arcand, K., **Tremblay, G. R.**, Watzke, M., Weisskopf, M., & Wilkes, B., *Light from the Void: Twenty Years of Discovery with NASA’s Chandra X-ray Observatory*, a coffee table book celebrating Chandra’s twentieth launch anniversary from Smithsonian Books (released October 22, 2019)
3. **Tremblay, G. R.** & Coppens, K., *What do Black Holes Eat for Dinner?*, a children’s book from Tumblehome Learning (released July 9, 2020)

Journal abbreviations used

A&A | *Astronomy & Astrophysics*
AN | *Astronomische Nachrichten*
ApJ | *The Astrophysical Journal*
ApJL | *The Astrophysical Journal Letters*
ApJS | *The Astrophysical Journal Supplement*
BAAS | *Bulletin of the American Astronomical Society*
MNRAS | *Monthly Notices of the Royal Astronomical Society*
JGR | *Journal of Geophysical Research*

This CV was last updated on June 12, 2024.