Anna Trindade Falcão

Date of birth: 4 Apr 1995 | **Nationality:** Brazilian, American | **Phone number:** (+1) 2022129751 (Mobile) | **Email address:** annatrindadefalcao@gmail.com | **Website:** annatrindadefalcao.com |

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ABOUT ME

I am an astrophysicist currently at the NASA Goddard Space Flight Center in Greenbelt (MD,USA), in close collaboration with the Center for Astrophysics | Harvard & Smithsonian in Cambridge (MA, USA), The Catholic University of America in Washington DC (USA), and the INAF (Rome, Brera, Italy). My research investigates black hole accretion and feedback through high-resolution, multi-wavelength observations, focusing on the interaction between active galactic nuclei (AGN) and their host galaxies. In particular, I study multiphase mass outflows and their role in regulating AGN feedback across different spatial scales.
My work combines observations from Chandra, HST, JWST, MUSE, ALMA, and other major facilities to trace the evolution of ionized and molecular gas from parsec to kiloparsec scales. I have extensive experience in data reduction, imaging, and spectral modeling using Chandra, XMM-Newton, NuSTAR, HST, ALMA and JWST, with a strong emphasis on photoionization modeling (Cloudy) and multi-wavelength imaging analysis (SAOImageDS9, CASA).

WORK EXPERIENCE

NASA POSTDOCTORAL RESEARCH FELLOW – NASA GODDARD SPACE FLIGHT CENTER (CODE 662) – 8 Jul 2025 – Current – GREENBELT, UNITED STATES

POSTDOCTORAL RESEARCHER – HARVARD & SMITHSONIAN | CENTER FOR ASTROPHYSICS – 2 Jun 2022 – 13 May 2025 – CAMBRIDGE, UNITED STATES

UNIVERSITY RESEARCH ASSISTANT – THE CATHOLIC UNIVERSITY OF AMERICA – 2 Jan 2018 – 11 May 2022 – WASHINGTON, UNITED STATES

EDUCATION AND TRAINING

12 OCT 2019 – 7 MAY 2022 Washington, United States
PH.D. IN PHYSICS The Catholic University of America

Final grade Cum Laude | **Thesis** Spatially-Resolved Mass Outflows in QSOs: Implications for AGN Feedback

3 JAN 2018 – 16 OCT 2019 Washington, United States
MASTER OF SCIENCE The Catholic University of America

Final grade Cum Laude

3 JAN 2014 – 15 DEC 2017 Belo Horizonte, Brazil
BACHELOR OF SCIENCE Universidade Federal de Minas Gerais

LANGUAGE SKILLS

Mother tongue(s): **PORTUGUESE**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	C2	C2	C2	C2	C2

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

SKILLS

Imaging Analysis Software

CASA | IRAF - Image Reduction and Analysis Facility | SAOImageDS9 | CIAO

Spectroscopic Analysis Software

XSPEC | SHERPA

Programming

Python | Pandas, NumPy, Astropy, Matplotlib

PUBLICATIONS

Hot, Photoionized X-Ray Gas in Two Luminous Type 2 Quasars: Chandra-HST Evidence for a Wind-driven Sequence

Anna Trindade Falcão et al 2026 ApJ 1000 242

Probing Active Galactic Nuclei–Interstellar Medium Feedback through Extended X-Ray Emission in ESO 137-G034

D. Ł. Król et al 2026 ApJ 998 135

Footprints in the Wind: Probing X-Ray Outflows in NGC 7469 Using Near-infrared Emission Lines

Léa M. Feuillet et al 2026 ApJ 997 287

Detection of Compton Scattering in the Jet of 3C 84

Ioannis Liodakis et al 2025 ApJL 994 L9

The Advanced X-ray Imaging Satellite Community Science Book

Michael Koss et al 2025

The X-ray Emission of NGC 5005: An Unobscured Low-Luminosity AGN with a Weakly Accreting Broad-Line Region

Anna Trindade Falcão et al 2025 ApJ 993 247

Mapping the Excitation Mechanisms in the LINER I Active Galactic Nucleus NGC 5005: Positive Feedback and a Thin LINER Cocoon

Anna Trindade Falcão et al 2025 ApJ 986 175

Quantifying Feedback from Narrow Line Region Outflows in Nearby Active Galaxies. V. The Expanded Sample

Revalski et al 2025 ApJ 984 32

Core Revelations: The Star Formation and Active Galactic Nucleus Connection at the Heart of NGC 7469

Feuillet et al 2025 ApJ 983 49

Deep Chandra Observations of NGC 5728. III. Probing the High-resolution X-ray Morphology and Multiphase ISM Interactions in the Circumnuclear Region

Anna Trindade Falcão et al 2024 ApJ 977 275

Hubble Space Telescope Observations of Nearby type 1 Quasars. I. Characterization of the Extended [O III] 5007A Emission

Anna Trindade Falcão et al 2024 MNRAS 535 621

Resolving a Candidate Dual Active Galactic Nucleus with ~100 pc Separation in MCG-03-34-64

Anna Trindade Falcão et al 2024 ApJ 972 185

The Evolution of Galaxies and Clusters at High Spatial Resolution with Advanced X-ray Imaging Satellite (AXIS)

Russell et al 2024 Universe 10 273

Discovery of Kiloparsec-scale Semirelativistic Fe K Complex Emission in NGC 5728

Anna Trindade Falcao et al 2024 ApJ 963 6

A UFO Seen Edge-on? Resolving Ultrafast Outflow Emission on 200 pc Scales with Chandra in the Active Nucleus of Mrk 34

Maksym et al 2024 ApJ 951 146

Deep Chandra Observations of NGC 5728: Morphology and Spectral Properties of the Extended X-Ray Emission

Anna Trindade Falcao et al 2023 ApJ 950 143

Tracking X-ray Outflows with Optical/Infrared Footprint Lines

Anna Trindade Falcao et al 2022 MNRAS 511 1420

Hubble Space Telescope [O III] Emission-line Kinematics in Two Nearby QSO2s: A Case for X-ray Feedback

Anna Trindade Falcao et al 2021 MNRAS 505 3054

Hubble Space Telescope Observations of [O III] Emission in Nearby QSO2s: Physical Properties of the Ionized Outflows

Anna Trindade Falcao et al 2021 MNRAS 500 1491

CONFERENCES AND SEMINARS

30 JUN 2025 – 4 JUL 2025 Vasto (Italy)
Probing the Role of X-ray Winds in Driving Large Scale Poster Outflows in Nearby Type 2 Quasars

Vasto Accretion Meeting: AGN
Poster

3 DEC 2024 – 6 DEC 2024 Boston (MA, USA)
Discovery of kpc-scale semi-relativistic Fe K emission in NGC 5728: Implications for AGN Feedback

25 Years of Science with Chandra
Poster

20 MAR 2024
A Chandra study of the AGN-host interaction in NGC 5728: extended ionized emission and ~0.1c outflows on kiloparsec-scales

The Catholic University of America Physics Colloquium
Invited Seminar

29 FEB 2024
Discovery of kpc-scale semi-relativistic Fe K emission in NGC 5728: Implications for AGN Feedback

Goddard Space Flight Center AGN Seminar
Invited Seminar

7 JAN 2024 – 11 JAN 2024 New Orleans (LA, USA)
Recent Discovery of Semi-Relativistic Fe K Emission in NGC 5728: Why Do We Care?

243rd AAS meeting
Public Contributed Talk at the CfA Booth

12 SEP 2023
AGN-Host Galaxy Interaction in the Nearby Universe with AXIS

AXIS Probe Seminar
Invited Talk

11 JUN 2023 – 16 JUN 2023 Easton (MD, USA)
Discovery of kpc-scale semi-relativistic Fe K emission in NGC 5728: Implications for AGN Feedback

Conference AGN Winds on the Chesapeake
Invited Talk

20 JUN 2022 – 24 JUN 2022 Sexten (Italy)
Tracking X-ray Outflows With Optical/IR Footprint Lines

Multiphase AGN Feeding & Feedback II: Linking the Micro to Macro Scales in Galaxies
Contributed Talk

23 NOV 2021
Tracking X-ray Outflows With Optical/IR Footprint Lines

Space Telescope Science Institute Colloquium
Invited Seminar

29 SEP 2021
Tracking X-ray Outflows With Optical/IR Footprint Lines

Harvard & Smithsonian Center for Astrophysics High Energy Seminar
Invited Seminar

2 NOV 2021
AGN-Driven Winds and Their Role in Galaxy Evolution

University of Washington Colloquium
Invited Seminar

23 OCT 2019
AGN Winds and How They Shape Galaxies

The Catholic University of America Physics Colloquium
Invited Seminar

6 JAN 2019 – 10 JAN 2019
Hubble Space Telescope Observations of [O III] Emission in Nearby QSO2s: Physical Properties of the Ionized Outflows

233rd AAS meeting
Poster

HONOURS AND AWARDS

13 JUL 2025
NASA POSTDOCTORAL PROGRAM FELLOWSHIP – NASA Goddard Space Flight Center

Project: Probing the Role of X-ray Gas in Effective AGN-Galaxy Feedback in the Local Universe
Reference: Dr. Andrew Ptak, USA

IN CONFERENCE PROCEEDINGS

Discovery of kpc-scale semi-relativistic Fe K emission in NGC 5728

Anna Trindade Falcao et al 2024
AAS High Energy Astrophysics Division meeting #21, id. 202.06. Bulletin of the American Astronomical Society, Vol. 56, No. 5 e-id 2024n5i202p06

Overview of the advanced x-ray imaging satellite (AXIS)

Christopher S. Reynolds et al 2023
Proc. SPIE 12678, UV, X-Ray, and Gamma-Ray Space Instrumentation for Astronomy XXIII, 126781E (5 October 2023);

Deep Chandra Observations of NGC 5728: A Study of Morphology and Spectral Properties of the Extended X-ray Emission

Anna Trindade Falcao et al 2023
American Astronomical Society Meeting #241, id. 360.22. Bulletin of the American Astronomical Society, Vol. 55, No. 2 e-id 2023n2i360p22

Tracking X-ray Outflows With Optical/IR Footprint Lines

Anna Trindade Falcao et al 2022
Multiphase AGN Feeding & Feedback II: Linking the Micro to Macro Scales in Galaxies, Groups, and Clusters, held 20-24 June, 2022 at Haus Sexten, Sexten, Italy.

Hubble Space Telescope Observations of [O III] Emission in Nearby QSO2s: Physical Properties of the Ionized Outflows

Anna Trindade Falcao et al 2021
American Astronomical Society, AAS Meeting #233, id.242.19

PRESS RELEASES

NASA's Hubble, Chandra Find Supermassive Black Hole Duo

NASA Hubble Press Release, September 09, 2024; Release ID: 2024-022t

APPROVED OBSERVING PROPOSALS

Resolving the Closest Separation Supermassive Black Hole Pair with VLA-A

Principal Investigator
Very Large Array Telescope Cycle 2026A

Monitoring the extreme variability of NGC 2992

co-Investigator
Swift Observatory (Italian Dedicated Time 2025)

The beastly core of the Seyfert 1 ESO 511-G030 is awoke!

co-Investigator
Swift Observatory (Italian Dedicated Time 2025)

Dual Fe Ka peaks in MCG-03-34-64 - a close merger pair in the local Universe?

co-Investigator
Chandra X-ray Observatory Cycle 27

NGC 5135: A CASE OF MASSIVE POSITIVE AGN FEEDBACK?

co-Investigator
Chandra X-ray Observatory Cycle 27

A SHARP VIEW OF THE EXCEPTIONAL FE Kα COMPLEX FROM THE BARE NUCLEUS OF ARK 120

co-Investigator
XRISM Cycle 2

Mass Outflow in the QSO2 Mrk 34: Probing the Role of the X-ray Wind

co-Investigator
XMM-Newton Cycle 24

A COMPLETE PICTURE OF REPROCESSING GAS: SUPPORTING THE XRISM OBS OF NGC 4051

co-Investigator
XMM-Newton Cycle 24

Cosmic Ray Spallation and the Enigmatic Extended Narrow Line Region of NGC 7212

co-Investigator
XRISM Cycle 1

The Spatially Extended Ultra-Fast Outflow (UFO) of the CT AGN NGC 5728

co-Investigator
Chandra X-ray Observatory Cycle 26

Probing the AGN-Host Relationship in the LINER /CT-AGN NGC 4102

co-Investigator
Hubble Space Telescope Cycle 31

MENTORING ACTIVITIES

1 OCT 2024 – CURRENT

Research Mentor in the Amity Regional High School Science Research Program

Institution: Amity Regional High School (Woodbridge & Orange, CT, USA)
Role: Mentor, Science Research Program
Description: Guiding high-school student **Tony Zhang** through the design, execution, and presentation of independent astrophysical research projects.

- **2024–2025:** *Investigating the Relationship Between the Luminosity and the Extent of the [O III] Narrow-Line Region in Nearby Type 2 Seyfert Galaxies*
- **2025–2026:** *Assessing [O III] Outflows and Feedback Efficiency in Nearby Type 1 Quasars*

SCIENTIFIC ACTIVITIES

Peer Review for Scientific Journals

The Astrophysical Journal (ApJ), *Monthly Notices of the Royal Astronomical Society (MNRAS)*, *Astronomy & Astrophysics (A&A),* and *Nature,* 2022 - present

1 SEP 2022 – 5 MAY 2025

Seminar Organizer

Center for Astrophysics | Harvard & Smithsonian High Energy Astrophysics Division Seminar, 2022-2025

Member of Scientific Organizing Committee (SOC)

AGN Winds on the Chesapeake Conference, Easton, MD, USA, 2023

Panel Review and Time Allocation Committees

National Science Foundation (NSF) - Astronomy & Astrophysics Grant, 2025
Telescope Time Allocation Committees:
- *Hubble Space Telescope (cycle 33)*, 2025
- *XRISM (cycle 1),* 2024
- *James Webb Space Telescope (cycle 3),* 2023

Science Collaborations

Co-Investigator and Member of the Science Team, *Advanced X-ray Imaging Satellite (AXIS)* - participating in mission science planning and preparatory analysis within the *Galaxies and Feedback* Working Group. AXIS was selected by NASA for *Phase A* study as a *Probe-class mission* to deliver sub-arcsecond X-ray imaging capabilities for galaxy and black-hole evolution studies, 2023 - present

Member, HEASARC Users Group (HUG) - contributing to the optimization of NASA's High Energy Astrophysics Science Archive Research Center (HEASARC) resources, user support, and data accessibility for the astrophysics community, 2024 - present