Behzad Tahmasebzadeh, Ph.D.

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Expertise in Handling & Modeling Big Data | Background in Astrophysics & Computational Research

Professional Experience

2023-... **Postdoctoral Research Fellow**, University of Michigan, Ann Arbor, USA.

2017-2023 **Research Assistance**, Shanghai Astronomical Observatory, Shanghai, China.

Education

2017-23 **Ph.D. in Astrophysics,** Shanghai Astronomical Observatory, Shanghai, China.
Thesis title: "Schwarzschild dynamical modeling of barred galaxies with IFU observation."

2013-16 **M.Sc. in Astrophysics**, Institute for Advanced Studies in Basic Sciences, Zanjan, Iran.
Thesis title: "Inflationary cosmological models in Scalar–tensor gravity".

2009-13 **B.Sc. in Nuclear Physics**, Buali-Sina University, Hamedan, Iran.

Honors/Awards

2023 **DDA Travel Grant** , 54th Annual Meeting of the Division on Dynamical Astronomy, USA.

2022 **CAS Prize**, awarded as 2022 Excellent International Student among all 114 institutes of the Chinese Academy of Science (CAS).

2017 **CAS-TWAS**, Ph.D. scholarship (most competitive scholarship for study Ph.D. in China).

2016 **First Rank** as a M.Sc graduate student at IASBS.

Skills

Software Development

- Team member of DYNAMITE, a software for stellar dynamical modeling. Modified core modules to enable modeling of barred galaxies ([ascl:2011.007]), University of Vienna.
- Team member of Capivara, a code for spectral-based segmentation of IFU data cubes.

Teaching

Certification
- Inclusive teaching in STEM fields for university students, Spring 2024, University of Michigan, USA.

Lecture
- Milky Way Structure (online), Spring 2023, Chengdu University, China.
- An introduction on Astrophysics, Spring 2012, BASU, Iran.

TA
- Computational physics for M.Sc students, Spring 2015, IASBS, Iran.

Advising and Mentorship

2023-present Mentored undergraduate students on research projects at the University of Michigan, USA, [Andrew Lapeer, Vincent Claes, Callum Bloor].

Skills (continued)

Technical Skills & Software Proficiency

Programming Languages	Python, Fortran, Bash (Unix), C++.
HPC	Experience with high-performance computing and analysis of large datasets
Astrophysical Software	DYNAMITE, FORSTAND, AGAMA, NAFF, GALFIT, NEMO, GIZMO, GALPY, MGEFIT, PPXF, GIST, DS9.

Professional Services

2024	Panelist for NASA Grant Review.
	Postdoc representative to the departmental faculty meetings, University of Michigan, USA.
2023-present	Journal referee (Astronomy and computing, New astronomy).
2023	Colloquium organizer, University of Michigan, USA.
	LOC, Great Lakes Clusters and Streams, University of Michigan, USA.
2019	LOC, Summer school on galactic dynamics, Shanghai Astronomical Observatory, China.
2018	LOC, The life and times of the Milky Way, Shanghai Astronomical Observatory, China.

Scientific Collaborations

2024-	• [Co-I] Chandra cycle 26, Black holes in compact stellar clusters: dynamical JWST measurements of black holes in concert with Chandra and VLA.
2023-	• [Co-I] JWST cycle 1, A census of black holes in compact stellar systems in the Virgo cluster.
	• [Co-I] High-resolution ACS/WFC3 Imaging of Compact Stellar Systems in the Virgo Cluster in Support of JWST Cycle 1 Science.
	• Associate Collaborator in the MUSE-TIMER Survey – Studying nearby barred galaxies using VLT/MUSE IFU data.
2020-	• Member of the DYNAMITE Software Development Team (a code for orbit-superposition dynamical modeling of stellar systems).
2019-2021	• Research Visit to MPE (Germany) – Developed techniques for dynamical modeling of barred galaxies in collaboration with MPE researchers.

Talk at Conferences/Colloquium

2025	"A census of black holes in low-mass galaxies with JWST/NIRSpec IFU, University of Colorado Boulder, USA.
2024	"A census of black holes in low-mass galaxies with JWST/NIRSpec IFU, University of Pennsylvania, USA.
	"Do Massive Black Holes Come in Small Packages?" The Physics Institute of the Federal University of Rio Grande do Sul, Brazil.
	"Massive Black Holes in Compact Stellar Systems?", Compact Objects in Michigan and Ontario (COMO) conference, USA.
2023	"Do Massive Black Holes Come in Small Packages?", University of Michigan colloquium, USA.
	"Determining the lower mass limit for central black hole masses detectable in the Virgo cluster by JWST NIRSpec". The First Year of JWST Science Conference, STSc, Baltimore, USA.

Talk at Conferences/Colloquium (continued)

"Schwarzschild Modeling of Barred So Galaxy NGC4371 with TIMER Survey", Galactic bars conference, Granada, Spain.

"Schwarzschild Modeling of Barred So Galaxy NGC4371 with TIMER Survey", 54th Annual Meeting of the Division on Dynamical Astronomy, East Lansing, USA.

2022 "Dynamical orbit decomposition of barred galaxies", DYNAMITE workshop, ICRAR, Australia.

2021 "Orbital origin of CX and OX structures in boxy-peanut bulges", Seminar talk, University of Central Lancashire, UK.

2020 "Orbit-based dynamical modeling of external barred galaxies", Dynamics workshop and follow-up on barred galaxies, University of Cambridge, UK.

"Schwarzschild modeling of the barred galaxy", DYNAMITE release event (software for dynamical modeling of galaxies), University of Vienna, Austria.

2019 "Deprojection of barred galaxies from photometry", MPE, Germany.

"Extract 3D density profile of barred galaxies from image", The art of measuring galaxy physical properties, Milan, Italy.

Publications

Refereed publications as first author

1. **B. Tahmasebzadeh**, A. Lapeer, E. Vasiliev et al. 2024, "The Lower Limit of Dynamical Black Hole Masses Detectable in Virgo Compact Stellar Systems Using the JWST/NIRSpec IFU", ApJ, [arXiv:2408.02142].
2. **B. Tahmasebzadeh**, S. Dattathri, M. Valluri et al. 2024, "Orbital support and evolution of cx/ox structures in boxy/peanut bars", ApJ, [arXiv:2409.03746].
3. **B. Tahmasebzadeh**, L. Zhu, J. Shen et al. 2024, "Schwarzschild Modeling of Barred So Galaxy NGC4371", MNRAS, [arXiv:2310.00497].
4. **B. Tahmasebzadeh**, L. Zhu, J. Shen et al. 2022, "Orbit-superposition Dynamical Modeling of Barred Galaxies", ApJ, [arXiv:2210.14218].
5. **B. Tahmasebzadeh**, L. Zhu, J. Shen et al. 2021, ""Deprojection of external barred galaxies from photometry", MNRAS, [arXiv:2110.06955].
6. **B. Tahmasebzadeh** and K. Karami 2017, "Generalized Brans-Dicke inflation with a quartic potential", Nuclear Physics B, [arXiv:1608.06543].
7. **B. Tahmasebzadeh**, K. Rezazadeh, and K. Karami 2016, "Generalized Brans-Dicke inflation with a quartic potential", JCAP, [arXiv:1605.00530].

Refereed publications as 2nd/3rd author with major contribution.

1. M. Taylor, **B. Tahmasebzadeh** et al. 2024, "A Supermassive Black Hole in a Diminutive Ultra-compact Dwarf Galaxy Discovered with JWST/NIRSpec+IFU", submitted to ApJ.
2. N. Kacharov, **B. Tahmasebzadeh**, M.L. Cioni et al. 2024, "Equilibrium dynamical models in the inner region of the Large Magellanic Cloud based on Gaia DR3 kinematics", A&A, [arXiv:2410.05374].
3. S. Thater, P. Jethwa, **B. Tahmasebzadeh** et al. 2022, "Testing the robustness of DYNAMITE triaxial Schwarzschild modelling: The effects of correcting the orbit mirroring,", A&A, [arXiv:2205.04165].
4. C. Yang, L. Zhu, **B. Tahmasebzadeh** et al. 2022, "Constructing the Milky Way Stellar Halo in the Galactic Center by Direct Orbit Integration", ApJ, [arXiv:2211.01534].

Refereed publications as contributing author.

1. R. S. de Souza et al. (including **B. Tahmasebzadeh**), 2024, "Capivara: A Spectral-based Segmentation Method for IFU Data Cubes", submitted to MNRAS, [arXiv:2410.21962].

Leading author papers in prep

1. **B. Tahmasebzadeh**, M. Valluri et al. 2024, "A New Look at the Double Nucleus Compact Elliptical NGC 4486B and its Supermassive Black Hole with JWST/NIRSpec IFU", to be submitted to ApJ.
2. Y. Jin, L. Zhu, **B. Tahmasebzadeh** et al. 2024, "Recovering the pattern speeds of edge-on (boxy/peanut or X-shaped) barred galaxies via the orbit-superposition method", to be submitted to A&A.