

Joaquín Hernández-Yévenes

ASTRONOMER · DATA ANALYST · DATA SCIENTIST

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Education

Universidad de Concepción

Concepción, Chile

MASTER DEGREE (MSc) IN ASTRONOMY

Mar, 2022 – Jan, 2024

- Thesis title: **WISE2MBH: A scaling-based algorithm for probing supermassive black hole masses through WISE photometry**
- Advisor: DR. NEIL NAGAR

PROFESSIONAL TITLE IN ASTRONOMY

Mar, 2018 – Aug, 2023

BACHELOR DEGREE (BSc) IN ASTRONOMY

Mar, 2018 – Dec, 2021

Experience

Universidad de Concepción

Concepción, Chile

DATA ANALYST

Feb. 2024 - Present

- Responsible for weekly reports on methods and results in the ETHER database.
- Maintenance of pipeline and WISE2MBH library for processing +3 million astronomical sources.
- Managed to optimize the time in observation proposals by 25% by implementing clustering algorithms.
- Training of +5 new team members for the TITANs Millennium Nucleus

RESEARCH ASSISTANT

Mar. 2022 - Jan. 2024

- Developed the WISE2MBH algorithm to address data completeness in the ETHER database.
- Co-author of +3 publications, presenting at conferences and securing +100 hours of observation time.

CLASS ASSISTANT

Aug. - Dec. 2023

- Responsible for conducting practical classes, elaborating and evaluating assignments and exams for two final year courses.

Harvard University

Cambridge, MA, USA

RESEARCH INTERNSHIP

Mar. - Apr. 2023

- Late stage development of the WISE2MBH algorithm that estimate supermassive black hole masses from WISE data.
- Explore uses for EHT, ngEHT, and ALMA to present proposals based on the algorithm estimates and population predictions.
- Discussion about WISE2MBH parent and final sample, and possible interest of the community.
- Discussion over super massive black hole binary candidates and strategies to detect them.

Publications

6

ON SYSTEMATICS OF SUPERMASSIVE BLACK HOLE MASS ESTIMATES WITHIN THE ETHER SAMPLE
Hernández-Yévenes J. & Nagar N.

2024
in prep.

5

EVENT HORIZON AND ENVIRONMENT (ETHER): I. FIVE BLACK HOLES AT 50–100 SCHWARZCHILD RADII RESOLUTION WITH THE EVENT HORIZON TELESCOPE
Nagar N., et al. (including Hernández-Yévenes J. and EHT Collaboration)

2024
in prep.

4

MULTI-FREQUENCY FUNDAMENTAL PLANE OF SMBH ACCRETION IN THE EHTER SAMPLE
Arratia V., Nagar N., Bandyopadhyay B. & Hernández-Yévenes J.

2024
in prep.

3

USING WISE CATALOGED DATA FOR MORPHOLOGY, BULGE FRACTION AND BLACK HOLE MASS ESTIMATION
Hernández-Yévenes J., Nagar N., Arratia V. & Jarrett T.H.

2024
Accepted in RMxAC

2

WISE2MBH: A SCALING-BASED ALGORITHM FOR PROBING SUPERMASSIVE BLACK HOLE MASSES THROUGH WISE CATALOGUES
Hernández-Yévenes J., Nagar N., Arratia V. & Jarrett T.H.

Jul, 2024
MNRAS

1

EVENT HORIZON AND ENVIRONS (ETHER): A CURATED DATABASE FOR EHT AND NGEHT TARGETS AND SCIENCE
Ramakrishnan V., Nagar N., Arratia V., Hernández-Yévenes J., Pesce D.W., Nair D.G., Bandyopadhyay B., et al.

Jan, 2023
Galaxies

Skills

Soft Skills	Leadership, Communication, Problem Solving, Goal Orientation
Programming	Python, SQL, Bash, TeX, HTML5, CSS
Software	TopCat, PowerBI, Excel, SSMS, DS9
Libraries	NumPy, Pandas, Matplotlib, Seaborn, SciPy, PyTorch, Tensorflow, statsmodels, scikit-learn
Languages	Spanish (native), English (fluent)

Workshops & Certificates

2024	Machine Learning Specialization, DeepLearning.AI & Stanford University	Certificate
2023	Certification in Machine Learning with Python, freeCodeCamp	Certificate
2022	Certification in Data Analysis with Python, freeCodeCamp	Certificate
2022	Certification in Scientific Computing with Python, freeCodeCamp	Certificate
2022	Certification in Cloud Computing, Google & Esc. de Org. Industrial	Certificate
2021	School of Physics of the Master in Physical Sciences, Universidad del Bío-Bío	

Successful PI and Co-PI observing proposals

6	TOWARDS RESOLVING ORBITING BINARY SMBH, PLUS SHADOWS, JETS, AND ACCRETION FLOWS OF SINGLE SMBH: ACA FLUXES <i>PI, 72.6 hours (7M), Priority C</i>	2023 ALMA Cycle 10
5	IMAGING M84 AND SOMBRERO AT < 50 GRAVITATIONAL RADII: JETS AND ACCRETION INFLOW <i>Co-PI (PI: Dhanya Nair), 12 hours (12M), Priority B</i>	2023 ALMA Cycle 10
4	A SAMPLE OF SMBH SHADOWS, RINGS, ACCRETION FLOWS AND JET BASES: EXPLORATORY EHT+ALMA FLUX MEASUREMENTS <i>Co-PI (PI: Neil Nagar), 45 hours (12M), Priority B</i>	2023 ALMA Cycle 10
3	A SAMPLE OF BLACK HOLES AT < 100 RG SCALES: ACCRETION FLOWS, JETS, AND SHADOWS <i>Co-PI (PI: Dhanya Nair), 22 hours (7mm), Priority A</i>	2022 VLBA 2023A
2	A SAMPLE OF SMBH SHADOWS, RINGS, ACCRETION FLOWS AND JET BASES: EXPLORATORY EHT+ALMA FLUX MEASUREMENTS <i>Co-PI (PI: Neil Nagar), 36 hours (12M), Priority B</i>	2022 ALMA Cycle 9
1	NGC4261: THE 2ND JET AT < 50 GRAVITATIONAL RADII (AND THE 3RD BLACK HOLE SHADOW?) <i>Co-PI (PI: Neil Nagar), 6 hours (12M), Priority B</i>	2022 ALMA Cycle 9

Teaching

Extragalactic Astronomy (Assistantship)	Universidad de Concepción, Concepción, Chile
PROFESSOR: DR. RICARDO DEMARCO	Semester II, 2023
Radioastronomy (Assistantship)	Universidad de Concepción, Concepción, Chile
PROFESSOR: DR. NEIL NAGAR	Semester II, 2023

Talks, Posters and Outreach

Nov, 2023	Using WISE cataloged data for morphology, bulge fraction and black hole mass estimation, Conference Poster	XVII RRLA-LARIM, Montevideo, Uruguay
Nov, 2022	La nueva generación del Telescopio Horizonte de Eventos (ngEHT) y Chile, Outreach Talk	Universidad de Concepción, Concepción, Chile