

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

- 4

EVENT HORIZON AND ENVIRONMENT (ETHER): I. FIVE BLACK HOLES AT 50–100 SCHWARZCHILD RADII RESOLUTION WITH THE EVENT HORIZON TELESCOPE
Ramakrishnan V., Nagar N., Arevalo P., Arratia V., **Hernández-Yévenes J.**, Pesce D.W., Nair D.G., et al. (EHT Collaboration)
in prep.

2024
- 3

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

2024
- 2

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

2024
- 1

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

Jan, 2023

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

11	TOWARDS RESOLVING BINARY SMBH, AND JETS+ACCRETION FLOWS IN SINGLE SMBH: EXPLORATORY EHT+ALMA FLUX MEASUREMENTS <i>Co-PI (PI: Neil Nagar), Submitted</i>	2024 <i>ALMA Cycle 11</i>
10	TOWARDS RESOLVING ORBITING BINARY SMBH, PLUS SHADOWS, JETS, AND ACCRETION FLOWS OF SINGLE SMBH <i>Co-PI (PI: Neil Nagar), Submitted</i>	2024 <i>ALMA Cycle 11</i>
9	IMAGING M84 AT < 50 GRAVITATIONAL RADII: JETS AND ACCRETION INFLOW (RESUBMISSION) <i>Co-PI (PI: Neil Nagar), Submitted</i>	2024 <i>ALMA Cycle 11</i>
8	JET LAUNCHING AND BLACK HOLE DEMOGRAPHICS: THE ‘GOLD SAMPLE’ <i>Co-PI (PI: Neil Nagar), Submitted</i>	2024 <i>ALMA Cycle 11</i>
7	SIX BLACK HOLES AT < 50 GRAVITATIONAL RADII: JET AND ACCRETION INFLOW DEMOGRAPHICS <i>Co-PI (PI: Neil Nagar), Submitted</i>	2024 <i>ALMA Cycle 11</i>
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 <i>ALMA Cycle 10</i>
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 <i>ALMA Cycle 10</i>
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 <i>ALMA Cycle 10</i>
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 <i>VLBA 2023A</i>
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 <i>ALMA Cycle 9</i>
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 <i>ALMA Cycle 9</i>

Teaching

Extragalactic Astronomy (Assistantship)

PROFESSOR: DR. RICARDO DEMARCO

*Universidad de Concepción,
Concepción, Chile
Semester II, 2023*

Radioastronomy (Assistantship)

PROFESSOR: DR. NEIL NAGAR

*Universidad de Concepción,
Concepción, Chile
Semester II, 2023*

Talks, Posters and Outreach

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