

# HELGA DÉNES

Yachay Tech University ◊ Hacienda San José S/N, 100119, Urcuquí, Ecuador  
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## PAST POSITIONS

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Professor Ocasional 2 *November 2022 - present*  
School of Physical Sciences and Nanotechnology, Yachay Tech University

Post-doctoral researcher *July 2018 - Dec 2021*  
ASTRON Netherlands Institute for Radio Astronomy

OCDE post-doctoral fellow *February 2015 - March 2018*  
A joint position between CSIRO Astronomy and Space Science; and The Australian National University,  
Research School of Astronomy and Astrophysics

## ACADEMIC QUALIFICATIONS

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**Swinburne University of Technology** *2011 - 2015*  
Co-supervised at: CSIRO Astronomy and Space Science

**Ph.D. in Astrophysics**

Thesis: A wide-field investigation into the HI content of galaxies

Supervisors: Virginia Kilborn (Swinburne), Bärbel Koribalski (CSIRO-CASS), Thibault Garel (Swinburne)

**Eötvös Loránd University** *2005 - 2010*

**MSc in Astronomy**

Thesis: Studies of the high-redshift quasar J1715+2147

Supervisor: Sándor Frey

## RESEARCH INTERESTS

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galaxy evolution, HI in galaxies, Galactic HI, Galactic HI absorption, interstellar medium (ISM), HI deficient galaxies, HI excess galaxies, radio sky surveys

**Current collaborations:**

- Member of the Apertif Imaging Surveys team.
- Member of The Galactic ASKAP Survey (GASKAP) team.
- Member of the Widefield ASKAP L-band Legacy All-sky Blind survey (WALLABY) team and co-chair of Science Working Group 1 (High Resolution: Milky Way & High-velocity Clouds).

## TECHNICAL SKILLS

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**Data reduction and processing experience:**

- MIRIAD, CASA, ASKAPsoft, AIPS

**Programming experience:**

- Python, IDL, C, SQL

**Observing experience:**

- Australia Telescope Compact Array (ATCA)
- William Herschel Telescope, GHaFaS (Galaxy H $\alpha$  Fabry-Perot System for WHT) instrument at Roque de los Muchachos Observatory La Palma
- 1m RCC Telescope and 60cm Schmidt Telescope on Pizskéstető Mountain Station in Hungary

## SUCCESSFUL OBSERVING PROGRAMS

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### Principal Investigator:

- Cold gas in the Milky Way at high Galactic latitudes (168 hours with the ATCA)
- Unveiling the nature of “dark” gas in Chamaeleon (60 hours with the ATCA)
- HI deficient galaxies in low and intermediate density environments (118 hours with ATCA)

### Co-Investigator:

- Molecular gas in HI eXtreme galaxies (Lutz et al., 14 hours ALMA project)
- How does CO trace the HI-to-H<sub>2</sub> Transition at Low Metallicity? (Jameson et al., 1.3 hours ALMA project)
- The JVLA-SAMI Cluster Survey (Banfield et al., 100 hours VLA project)
- Gas Temperature Demography in the Magellanic Clouds (804 hours ATCA large project)
- Exploring the pattern of the Galactic HI foreground of GRBs with ATCA (Zahortecz et al., 24 hours ATCA project)
- What governs the neutral hydrogen content of spiral galaxies? (Kilborn et al., 144 hours ATCA project)
- Taking the Temperature of the Riegel-Crutcher Cloud (McClure-Griffiths et al., 95 hours ATCA project)
- Gas accretion in nearby spiral galaxies (Lutz et al., 6 nights on the Wide-Field Spectrograph on the ANU 2.3 meter telescope)
- Gas accretion in nearby spiral galaxies (Kilborn et al., 440 hours ATCA large project)

## PUBLICATIONS

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OrcidID: 0000-0002-9214-8613

### Refreed

#### First authored:

1. *Characterising the Apertif primary beam response*  
**H. Dénes**, K. M. Hess, E. A. K. Adams, A. Kutkin, R. Morganti, J. M. van der Hulst, T. A. Oosterloo, V. A. Moss, B. Adebahr, W. J. G. de Blok, M. V. Ivashina, A. H. W. M. Coolen, S. Damstra, B. Hut, G. M. Loose, D. M. Lucero, Y. Maan, Á. Mika, M. J. Norden, L. C. Oostrum, D. J. Pisano, R. Smits, W. A. van Cappellen, R. van den Brink, D. van der Schuur, G. N. J. van Diepen, J. van Leeuwen, D. Vohl, S. J. Wijnholds, J. Ziemke, 2022 A&A.667, 40  
 DOI: <https://doi.org/10.1051/0004-6361/202244045>
2. *Exploring the pattern of the Galactic HI foreground of GRBs with the ATCA*  
**H. Dénes**, P.A. Jones, L.V. Tóth, S. Zahortecz, B-C. Koo, S. Pinter, I.I. Racz, L.G. Balázs, M.R. Cunningham, Y. Doi, I. Horvath, T. Kovács, T. Onishi, N. Suleiman, Z. Bagoly, 2019 MNRAS, 489, 3778  
 DOI: <https://doi.org/10.1093/mnras/stz2314>
3. *Calibrating the HISA temperature: Measuring the temperature of the Riegel-Crutcher cloud*  
**H. Dénes**, N. M. McClure-Griffiths, M. Dickey, J. R. Dawson, C. E. Murray, 2018 MNRAS, 479, 1465  
 DOI: <https://doi.org/10.1093/mnras/sty1384>

4. *HI-deficient galaxies from high to low density environments*  
H. Dénes, V. A. Kilborn, B. S. Koribalski, O. I. Wong, 2016 MNRAS, 455, 1294  
DOI: <https://doi.org/10.1093/mnras/stv2391>
5. *New HI scaling relations to probe the HI content of galaxies via global HI-deficiency maps*  
H. Dénes, V. A. Kilborn, B. S. Koribalski, 2014, MNRAS, 444, 667  
DOI: <https://doi.org/10.1093/mnras/stu1337>

**Co-authored:**

1. *First release of Apertif imaging survey data*  
Adams et al. 2022, A&A, 667, 38  
DOI: <https://doi.org/10.1051/0004-6361/202244007>
2. *Continuum source catalog for the first APERTIF data release*  
Kutkin et al. 2022, A&A, 667, 39  
DOI: <https://doi.org/10.1051/0004-6361/202244008>
3. *ALMA/ACA CO Survey of the IC 1459 and NGC 4636 Groups: Environmental Effects on the Molecular Gas of Group Galaxies*  
Lee et al. 2022. accepted to ApJSS  
ArXiv: <https://arxiv.org/abs/2204.06022>
4. *GASKAP-HI Pilot Survey Science III: An unbiased view of cold gas in the Small Magellanic Cloud*  
Dempsey et al. 2022, PASA, 39, 34  
DOI: <https://doi.org/10.1017/pasa.2022.18>
5. *The characteristics of polarised radio sources in the Apertif Science Verification Campaign fields*  
Adhebar et al. 2022, A&A, 663, A103  
DOI: <https://doi.org/10.1051/0004-6361/202243201>
6. *Dual-frequency single-pulse study of PSR B0950+08*  
Bilous et al. 2022, A&A, 658, 143  
DOI: <https://doi.org/10.1051/0004-6361/202142242>
7. *GASKAP-HI Pilot Survey Science I: ASKAP Zoom Observations of HI Emission in the Small Magellanic Cloud*  
Pingel et al. 2022, PASA, 39, 5  
DOI: <https://doi.org/10.1017/pasa.2021.59>
8. *WALLABY pilot survey: HI gas disc truncation and star formation of galaxies falling into the Hydra I cluster*  
Reynolds et al. 2022, MNRAS, 510, 1716  
DOI: <https://doi.org/10.1093/mnras/stab3522>
9. *GASKAP Pilot Survey Science II: ASKAP Zoom Observations of Galactic 21-cm Absorption*  
Dickey et al. 2022, ApJ 926, 186  
DOI: <https://doi.org/10.3847/1538-4357/ac3a89>
10. *Apercal - The Apertif Calibration Pipeline*  
Adebahr et al. 2022, A&C, 38, 100514  
DOI: <https://doi.org/10.1016/j.ascom.2021.100514>
11. *Combining LOFAR and Apertif Data for Understanding the Life Cycle of Radio Galaxies*  
Morganti et al. 2021, Galax, 9, 88  
DOI: <https://doi.org/10.3390/galaxies9040088>
12. *Apertif, Phased Array Feeds for the Westerbork Synthesis Radio Telescope*  
van Cappellen et al. 2021, A&A, 658, 146

DOI: <https://doi.org/10.1051/0004-6361/202141739>

13. *WALLABY Pre-Pilot Survey: the effects of angular momentum and environment on the H I gas and star formation properties of galaxies in the Eridanus supergroup*  
Murugeshan et al. 2021, MNRAS, 507, 2949  
DOI: <https://doi.org/10.1093/mnras/stab2314>
14. *Chromatic periodic activity down to 120 MHz in a Fast Radio Burst*  
Pastor-Marazuela et al. 2021, Nature 596, 505–508  
DOI: <https://doi.org/10.1038/s41586-021-03724-8>
15. *WALLABY Pre-Pilot Survey: H I Content of the Eridanus Supergroup*  
For et al. 2021, accepted to MNRAS  
DOI: <https://doi.org/10.1093/mnras/stab2257>
16. *WALLABY pre-pilot survey: Two dark clouds in the vicinity of NGC 1395*  
Wong et al. 2021, accepted to MNRAS  
DOI: <https://doi.org/10.1093/mnras/stab2262>
17. *WALLABY Pilot Survey: the diversity of ram pressure stripping of the galactic HI gas in the Hydra Cluster*  
Wang et al. 2021, ApJ, 915, 70  
DOI: <https://doi.org/10.3847/1538-4357/abfc52>
18. *A search for radio emission from double-neutron star merger GW190425 using Apertif*  
Boersma et al. 2021, A&A, 650, 131  
DOI: <https://doi.org/10.1051/0004-6361/202140578>
19. *Apertif view of the OH Megamaser IRAS 10597+5926: OH 18 cm satellite lines in wide-area HI surveys*  
Hess et al. 2021, A&A, 647, 193  
DOI: <https://doi.org/10.1051/0004-6361/202040019>
20. *The best of both: combining LOFAR and Apertif to derive resolved radio spectral index images*  
R. Morganti et al., 2021, A&A, 648, 9  
DOI: <https://doi.org/10.1051/0004-6361/202039102>
21. *Structure and kinematics of shocked gas in Sgr B2: further evidence of a cloud-cloud collision from SiO emission maps*  
Armijos-Abendaño, et al., 2020, MNRAS, 499, 4918  
DOI: <https://doi.org/10.1093/mnras/staa3119>
22. *A bright, high rotation-measure FRB that skewers the M33 halo*  
Connor, et al., 2020 MNRAS, 2810  
DOI: <https://doi.org/10.1093/mnras/staa3009>
23. *Extreme intra-hour variability of the radio source J1402+5347 discovered with Apertif*  
Oosterloo, et al., 2020 A&A, 641L, 40  
DOI: <https://doi.org/10.1051/0004-6361/202038378>
24. *WALLABY - an SKA Pathfinder HI survey*  
Koribalski, et al., APSS 2020, 365, 118  
DOI: <https://doi.org/10.1007/s10509-020-03831-4>
25. *Spatial Variations of HI Turbulent Properties in the Small and Large Magellanic Cloud*  
S. Szotkowski, et al., 2019, ApJ, 887, 111S  
DOI: <https://doi.org/10.3847/1538-4357/ab53df>

26. *The 3D kinematics of gas in the Small Magellanic Cloud*  
Murray, et al., 2019, ApJ, 887, 267M  
DOI: <https://doi.org/10.3847/1538-4357/ab510f>
27. *The ASKAP-EMU Early Science Project: Radio Continuum Survey of the Small Magellanic Cloud*  
Joseph, et al., 2019, MNRAS, 490, 1202  
DOI: <https://doi.org/10.1093/mnras/stz2650>
28. *An ATCA Survey of HI Absorption in the Magellanic Clouds I: HI Gas Temperature Measurements in the Small Magellanic Cloud*  
Jameson, et al., 2019, ApJS, 244, 7  
DOI: <https://doi.org/10.3847/1538-4365/ab3576>
29. *Discovery of a Pulsar-powered Bow Shock Nebula in the Small Magellanic Cloud Supernova Remnant DEMS5*  
Alsaberi, et al., 2019, MNRAS, 486, 2507  
DOI: <https://doi.org/10.1093/mnras/stz971>
30. *Angular momentum regulates HI gas content and HI central hole size in the discs of spirals*  
Murugeshan, et al., 2019, MNRAS, 483, 2398  
DOI: <https://doi.org/10.1093/mnras/sty3265>
31. *On the dynamics of the Small Magellanic Cloud through high-resolution ASKAP HI observations*  
Di Teodoro, et al., 2019, MNRAS, 483, 392  
DOI: <https://doi.org/10.1093/mnras/sty3095>
32. *Cold gas outflows from the Small Magellanic Cloud traced with ASKAP*  
McClure-Griffiths, **Dénes**, et al., 2018, Nature Astronomy, 2, 901  
DOI: <https://www.nature.com/articles/s41550-018-0608-8>
33. *The HIX galaxy survey II: HI kinematics of HI eXtreme galaxies*  
Lutz, et al., 2018 MNRAS, 476, 3744  
DOI: <https://doi.org/10.1093/mnras/sty387>
34. *The HIX galaxy survey I: Study of the most gas rich galaxies from HIPASS*  
Lutz, et al., 2017 MNRAS, 467, 1083  
DOI: <https://doi.org/10.1093/mnras/stx053>
35. *Choirs, H I galaxy groups: catalogue and detection of star-forming dwarf group members*  
Sweet, et al., 2013, MNRAS, 433, 543  
DOI: <https://doi.org/10.1093/mnras/stt747>

### Conference proceedings

1. *A cloud-cloud collision in Sgr B2? 3D simulations meet SiO observations*  
W. E. Banda-Barragán, J. Armijos-Abendaño, **H. Dénes**, 2022 accepted to Proceedings of the IAU Symposium 362 “Predictive Power of Computational Astrophysics as a Discovery Tool”  
ArXiv: <https://arxiv.org/abs/2204.12603>
2. *Finding galaxies with unusual HI content*  
**H. Dénes**, V. A. Kilborn, B. S. Koribalski, 2014, ASPC, 480, 279D ArXiv: <https://arxiv.org/abs/1312.2685>

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### SEMINAR & CONFERENCE PRESENTATIONS

#### List of colloquiums:

- Colloquium at Swinburne University of Technology, Melbourne, Australia 2020  
*The first seven months of the Apertif Imaging Survey*
- Colloquium at University of Hamburg, Hamburg, Germany 2018  
*A wide-field investigation into the HI content of galaxies*
- Colloquium at Macquarie University, Sydney, Australia 2017  
*Measuring the Temperature of the Riegel-Crutcher Cloud*
- Colloquium at Konkoly Observatory, Budapest, Hungary 2017  
*Measuring the Temperature of the Riegel-Crutcher Cloud*
- Colloquium at Escuela Politécnica Nacional, Quito, Ecuador 2017  
*Neutral Hydrogen in Galaxies*
- Colloquium at The Australian National University, Canberra, Australia 2015  
*A wide-field investigation into the HI content of galaxies*
- Colloquium at CSIRO, Sydney, Australia 2015  
*A wide-field investigation into the HI content of galaxies*
- VIVA talk at Swinburne University, Sydney, Australia 2015  
*A wide-field investigation into the HI content of galaxies*
- Colloquium at Swinburne University of Technology, Melbourne, Australia 2014  
*Global HI properties of galaxies in the Southern Sky*

### List of conference and short presentations from the last 3 years

- Wallaby Science Meeting 2021 *online 2021*  
*Cold neutral hydrogen at high Galactic latitudes with the WALLABY survey*
- European Astronomical Society Annual meeting (EAS) 2021 *Leiden, online 2021*  
*Characterising the Apertif primary beam response*
- ISM 2021: Structure, characteristic scales, and star formation *Beirut, online 2021*  
*Cold neutral hydrogen at high Galactic latitudes with the WALLABY survey*
- Wallaby Science Meeting 2020 *online 2020*  
*Searching for cold gas at high Galactic latitudes*
- Talk, One year Apertif mini-symposium *online 2020*  
*Small galaxy groups in the Apertif imaging survey*
- Lunch talk, ASTRON *online 2020*  
*Exploring the HI content of small galaxy groups with Apertif*
- Talk, 2nd Australia-ESO joint conference: The build-up of galaxies through multiple tracers and facilities *Perth, Australia 2020*  
*Exploring galaxy evolution with Apertif*
- Poster, The Annual Conference on Astronomical Data Analysis and Software Systems (ADASS) *Groningen, Netherlands 2019*  
*Uncovering the gas content of galaxies with Apertif*
- Poster, 12th Square Kilometre Array (SKA) Pathfinder HI Survey Coordination Committee (PHISCC) workshop *Perth, Australia 2019*  
*Dark gas around the Chamaeleon molecular cloud*
- Lunch talk, Kapteyn Astronomical Institute, University of Groningen *Groningen, Netherlands 2019*  
*Hunting for cold gas with HI absorption*

### SCHOLARSHIPS AND GRANTS

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The Leids Kerkhoven-Bosscha Fonds (LKBF) Travel Grant 2020

Student Travel Grant of the Australian Astronomical Society 2013

## OUTREACH AND TEACHING

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### Student supervision:

- co-supervisor for an undergraduate student project at Swinburne University of Technology, April - June 2020  
student: Brandon Venville, main supervisor: Prof. Virginia Kilborn,  
Project title: *Galaxy groups in the Aperitif survey*
- student supervisor for Swinburne Astronomy Online (SAO) for 2 semesters in 2012  
Duties: Helping students with their main project for the semester and grading the submitted project

### Lectures:

- Escuela de Programación para Investigación Científica - EPIC 1, online workshop, 18 - 22 October 2021  
*Python tutorial for handling 3D data cubes in Astronomy*
- XII Olimpiada Latinoamericana de Astronomía y Astronáutica OLAA 2020, online outreach talk, 26 November 2020  
*How to measure the invisible gas in galaxies?*
- Grupo de Investigadores Latitud Cero online outreach talk, 4 June 2020  
*How to measure the invisible gas in galaxies?*
- Extragalactic Astronomy Lecture for Ecuadorian students participating in the OEAA (Olympiad of Astronomy and Astronautics) 2019
- 2019 ASTRON Summer Program  
*HI in galaxies*
- Curso Programación Científica, 12-16 March 2018 Ambato, Ecuador, Universidad Técnica de Ambato  
*Basics of Python*
- CSIRO Radio Astronomy School 2017, 25-29 September 2017, Narrabri, Australia  
*Calibration*
- III Escuela Ecuatoriana de Astronomía y Astrofísica, 24-26 July 2017, Quito, Ecuador  
*Gaussian Decomposition*
- Harley Wood School of Astronomy, Kioloa, Australia, 6-9 July 2017  
*Radio Astronomy*
- First Ecuadorian School of Radio Astronomy - 11-13 January 2017, Quito, Ecuador  
*Overview of Radio Telescopes*
- First Ecuadorian School of Radio Astronomy - 11-13 January 2017, Quito, Ecuador  
*Cold gas in galaxies*
- ANU RSAA Winter School 13-17 July 2015, Canberra, Australia  
*HI in galaxies*

### Other events:

- Girls Day 2019 outreach event at ASTRON, Netherlands, 11 April 2019
- CSIRO representative at the Sydney Astrofest, Sydney, Australia, 1 July 2017
- Project supervisor at the 2016 ANU RSAA Winter School, Canberra, Australia, 27 June 2016 – 03 July 2016
- Aurora College Master Class, Sydney, Australia, 5 May 2016
- Black Hole Society Public Talk at The Australian National University, Canberra, Australia, 20 October 2015
- Swinburne AstroTours guide (2011 - 2015), Melbourne, Australia
- Venus Transit 2012 host at Swinburne University outreach event, Melbourne, Australia
- Radio interview about archaeoastronomy in Hungary, 2010

· Physics day in Krúdy Gyula Highschool in Győr, Hungary, 29 January 2010

## LEADERSHIP

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Member of the organising committee for Escuela de Programación para Investigación Científica - EPIC 1	<i>online 18-22 October 2021</i>
SOC for WALLABY Science Meeting 2020	<i>online 12 November 2020</i>
Co-chair of the WALLABY Science Working Group 1 (High Resolution: Milky Way & High-velocity Clouds)	<i>2019 - present</i>
Member of the Apertif Survey Executive (ASE)	<i>2018 - 2022</i>
Member of the ASTRON Summer Student Program organising committee	<i>2019 - 2020</i>
SOC and LOC for the 2017 Bolton and Student Symposium	<i>Sydney, Australia 2017</i>
SOC for the CSIRO Radio Astronomy School 2017	<i>Narrabri, Australia 2017</i>
SOC for the First Ecuadorian Radio Astronomy School	<i>Quito, Ecuador 2017</i>
Member of the Colloquium organising committee at ANU RSAA	<i>2016 - 2017</i>
LOC for The role of hydrogen in the evolution of galaxies	<i>Kuching, Malaysia 2014</i>
Student representative on CAS Equity and Diversity Committee at Swinburne U.	<i>2013 - 2014</i>
Student representative on the Faculty Research Committee for ICT at Swinburne U.	<i>2013 - 2014</i>
CAS Student activity organiser at Swinburne U.	<i>2012 - 2013</i>
LOC for the Women in Astronomy Workshop 2012	<i>Melbourne, Australia 2012</i>

## PROFESSIONAL SOCIETIES

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International Astronomical Union (IAU)  
The Astronomical Society of Australia (ASA)

## REFEREE FOR JOURNALS

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Monthly Notices of the Royal Astronomical Society (MNRAS)  
Astronomy & Astrophysics (A&A)  
The Astrophysical Journal (ApJ)  
The Astronomical Journal (AJ)

## LANGUAGES

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<b>Hunagarian</b>	First language
<b>English</b>	Fluent
<b>German</b>	Fluent
<b>Spanish</b>	Basic

## REFERENCES

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