

# Juan Venancio Hernández Santisteban

## Curriculum Vitae

School of Physics & Astronomy  
University of St. Andrews  
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## Education

- 2012–2016 **PhD in Physics**, *University of Southampton*, Southampton, United Kingdom.  
Thesis: Multi-wavelength Observations of Accreting Compact Objects.  
Exam Date: 5 September 2016.  
Advisor: Prof. Christian Knigge  
Thesis Examiners: Prof. Phil A. Charles and Dr. Danny Steeghs
- 2009–2011 **M.Sc in Astronomy**, *Universidad Nacional Autónoma de México*, Mexico City, Mexico.  
Thesis: Photometric and spectroscopic study of the cataclysmic variable J0644+3344.  
Exam Date: 29 June 2011.  
Advisor: Prof. Juan Echevarría Román
- 2004–2008 **B.Eng. Mechanical Engineer**, *Universidad Nacional Autónoma de México*, Mexico City, Mexico.  
Thesis: Heat transfer finite element analysis of the mechanical structure of ESOPO spectrograph.  
Exam Date: 16 February 2009.  
Advisor: Dr. Alejandro Farah Simón

## Professional history

- 2019–Present **Research Fellow**, *Astronomy Group, University of St. Andrews*, UK.  
Researcher in echo mapping of Active Galactic Nuclei through multi-wavelength observations with Prof. Keith Horne.
- 2016–2019 **Postdoctoral Researcher**, *Anton Pannekoek Institute, University of Amsterdam*, the Netherlands.  
Researcher in multi-wavelength follow-up and characterisation of low-level accreting compact objects with Dr. Nathalie Degenaar.

## Teaching

- 2014 – 2016 **Instructor**, *University of Southampton*, Southampton, UK.  
Instructor in the field-trip for courses in *European Dimension in Space and Design*; and *Observation in Astronomy* at the Teide Observatory, Tenerife, Spain.
- 2012 – 2016 **Teaching Assistant**, *University of Southampton*, Southampton, UK.  
Teacher assistant in undergraduate courses such as: Galaxies, Stellar Evolution and Programming and Data Analysis.
- 2010 – 2012 **High School Teacher**, *Green Hills School*, Mexico City, Mexico.  
Physics teacher in middle school and advanced mathematics at GSCE/A-level.

## Service

- NASA/TESS review panel
- Referee for the Mexican GTC Allocation Committee.
- Referee for Monthly Notices of the Royal Astronomical Society (MNRAS).
- Referee for the Mexican Research Council (CONACyT)
- Junior Member of the International Astronomical Union (2019–present).
- Junior Member of the Large Synoptic Sky Survey (LSST)-UK (2019-2022).
- External Collaborator of the Sloan Digital Sky Survey Reverberation Mapping project (SDSS-RM).

## Supervision and Mentoring

2016-2019	PhD mentoring, Jakob van den Eijnden	2018-2019	MSc. supervising, Elena López-Navas
2018-2019	PhD mentoring, Amruta Jaodand	2019	BSc. supervising, Lewis McCallum
2017-2018	PhD mentoring, Aastha Parikh	2018	BSc. supervising, Mick Rustenburg
2017	PhD mentoring, Liliana Rivera-Sandoval	2018	BSc. supervising, Levi Kok
2018-2019	MSc. supervising, Maria Georganti		

## Invited Talks and Conferences

– **20 academic talks since September 2012.** Recent highlights include seminars at JBCA Manchester, IoA/Cambridge, IA-UNAM, Southampton and Oxford.

– **Solicited conference talks** at *COSPAR/CV-Nova session* (2018, Pasadena) and *Accretion Week* (2017, La Gomera); contributed talks at the *29th Texas Symposium on Relativistic Astrophysics* (2017, Cape Town), *The Future of Astronomy and Planetary Science in the Ultraviolet* (2016, Warwick), *Formation and Evolution of Neutron Stars* (2015, Bonn) and *The Zoo of Accreting Compact Objects* (2015, Leiden).

## Organisation

- 2019 **ASPIRE summer school, SOC (chair)**, Amsterdam, NL.
- 2019 **From winds to jets: the role of outflows in compact binaries, SOC & LOC (chair)**, Amsterdam, NL.
- 2019 **White dwarf binaries - from SN Ia to gravitational wave sources, SOC**, Yerevan, Armenia.

## Scholarships, Grants and Awards

- 2019–present CONACyT (Mexican Research Council) Sistema Nacional de Investigadores - SNI level I
- 2019-2020 Visiting researcher at the University of Southampton.
- 2017 LKBF travel grant Accretion Week Workshop at La Gomera, Spain.  
€450
- 2016 COST Short Term Scientific Mission grant to visit the Institute of Astronomy, University of Cambridge for 2 months.  
€2500
- 2016 *Carlos Fuentes Award* for the most distinguished Mexican student in the UK. Awarded by the Mexican Embassy in the UK and the Society of Mexican Students in the United Kingdom.
- 2014 Royal Astronomical Society travel grant for academic visit to Columbia University and the American Museum of Natural History in New York, USA.  
£650
- 2014 Outstanding Astronomy Postgraduate Award for public engagement at University of Southampton.
- 2012–2016 Full Scholarship for PhD studies granted by Consejo Nacional de Ciencia y Tecnología (CONACyT) in its *Scholarships for Studies in Foreign Countries*.
- 2012–2015 Postgraduate Research Scholarship Fund granted by the University of Southampton for the duration of my PhD studies.  
£9000
- 2009-2011 Full Scholarship granted by Consejo Nacional de Ciencia y Tecnología (CONACyT) for the duration of my Master in Science (Astronomy) studies.

## Outreach and Public Engagement

- 2020. Public talk at the Dundee Astronomical society.
- 2014-2016. Mobile planetarium manager (Astrodome) in the outreach astronomy team at the University of Southampton.
- 2012-2017. Astronomy talks at the XI, XII, XIII and XV Symposiums of Mexican Students and Studies in the UK.

- Public outreach talks at Southampton Astronomical Society (2015) and BBC Stargazing Live 2016.

## Publication List

For a full list of publications @ ORCID: [0000-0002-6733-5556](https://orcid.org/0000-0002-6733-5556)

### First Author

- 2020 MNRAS **Hernández Santisteban J.V.**, Edelson R., Horne K. et al., "*Intensive disc-reverberation mapping of Fairall 9: 1st year of Swift & LCO monitoring*", 2020, MNRAS, submitted
- 2019 MNRAS **Hernández Santisteban J.V.**, Cúneo V., Degenaar N., van den Eijnden J., Altamirano D., Gómez M. N., Russell D M., Wijnands R., Golovakova R., Reynolds M. T. & Miller J.M., "*Multiwavelength characterisation of the accreting millisecond X-ray pulsar and ultra-compact binary IGR J17062–6143*", 2019, MNRAS, 488, 4596
- 2019 MNRAS **Hernández Santisteban J.V.**, Echevarría J., Zharikov S. et al. "*From outburst to quiescence: spectroscopic evolution of V1838 Aql imbedded in a bow-shock nebula*", 2019, MNRAS, 486, 2631
- 2018 MNRAS **Hernández Santisteban J.V.**, Knigge C., Pretorius, M. L., Sullivan, M. & Warner, B., "*The space density of post-period minimum cataclysmic variables*", 2018, MNRAS, 473, 3241.
- 2017 MNRAS **Hernández Santisteban J.V.**, Echevarría J., Michel R. & R. Costero, "*Doppler Tomography and Photometry of the Cataclysmic Variable 1RXS J064434.5+334451*", 2017, MNRAS, 123, 456.
- 2016 Nature **Hernández Santisteban J.V.**, Knigge, C., Littlefair, S. P., Breton, R. P., Dhillon, V. S., Gänsicke, B. T. and Marsh, T. R., Pretorius, M. L., Southworth, J. & Hauschildt, P. H., "*An irradiated brown-dwarf in an accreting white dwarf*", 2016, Nature, 533, 366.

### Second author and/or student supervised

- 2020 MNRAS López-Navas E., Degenaar N., Parikh A., **Hernández Santisteban J.V.**, J. van den Eijnden, "*The connection between the optical/UV and X-ray emission in the neutron star low-mass X-ray binary Aql X-1*", 2020, MNRAS, submitted
- 2019 ApJ Jaodand, A., **Hernández Santisteban J.V.**, Archibald, A. Hesses, J. Bogdanov, S., Knigge C., et al., "*Discovery of UV moding and millisecond pulsations in the low-mass X-ray binary state of transitional millisecond pulsar PSR J1023+0038*", 2020, ApJ, submitted.
- 2019 Rev. Mex. A. A. Parikh A. S., **Hernández Santisteban J.V.**, Wijnands, R. & Page, D., "*Multiwavelength observations of MASTER OT 075353.88+174907.6: a likely superoutburst of a long period dwarf nova system*", 2018, Rev. Mex. A. A., 55, 55.
- 2018 MNRAS Rivera-Sandoval, L. E., **Hernández Santisteban J.V.**, N. Degenaar, R. Wijnands, C. Knigge, J. M. Miller, M. Reynolds, D. Altamirano, M. van den Berg & A. Hill, "*UV observations of the tMSPs XSS J12270-4859 and PSR J1023+0038 during their pulsar state*", 2018, MNRAS, 476, 1086

### Collaborations

- 2019 Rev. Mex. A. A. Castro A., Altamirano D., Michel R., Gandhi, P., **Hernández Santisteban J.V.**, Tejada, C., Echevarria J., Sierra G., Knigge C., Colorado E., Hernandez-Landa J., Whiter, D. Middleton, M. Garcia, B. Guisa, G. & Ivchenko, N., "*OPTICAM: A triple-camera optical system designed to explore the fastest timescales*", 2019, Rev. Mex. A. A., 55, 363.
- 2019 White Paper The MSE Science Team, Bergemann. M., Huber D., Bitsch B., et al., "*The Detailed Science Case for the Maunakea Spectroscopic Explorer, 2019 edition*", 2019, ApJ, arXiv:1904.04907.
- 2019 White Paper Bergemann. M., Huber D., Bitsch B., et al., "*MSE stars & exoplanets science case*", 2019, ApJ, arXiv:1903.03157.

- 2019 MNRAS Beri A., Tetarenko B.E., Bahramian A., Altamirano D., Gandhi P, Sivakoff G. R., Degenaar N., Middleton M. J., Wijnands R., **Hernández Santisteban J.V.** & Paice J. A., "Swift J1357.2-0933 as seen with Swift and NuSTAR during its 2017 outburst", 2019, *MNRAS*, 485, 3064.
- 2019 MNRAS van den Eijnden, J., Degenaar, N., Schulz, N. A., Nowak M. A., Wijnands, R., Russell, T. D., **Hernández Santisteban J.V.**, Bahramian, A., Maccarone T. J., Kennea J. A. & Heinke C., "Chandra reveals a possible ultra-fast outflow in the super-Eddington Be/X-ray binary Swift J0243.6+6124", 2019, *MNRAS*, 487, 4355.
- 2019 MNRAS van den Eijnden, J., Degenaar, N., Russell, T. D. , **Hernández Santisteban J.V.**, Wijnands, R., Miller-Jones, J. C. A. , Rouco Escorial, A., Sivakoff, G. , "A re-establishing jet during X-ray rebrightenings of the Be/X-ray binary Swift J0243.6+6124", 2019, *MNRAS*, 483, 4628.
- 2019 Rev. Mex. A. A. Echevarría J., de Miguel E. , **Hernández Santisteban J.V.** et al., "Extensive Photometry of V1838 Aql during the 2013 superoutburst", 2019, *Rev. Mex. A. A.*, 55, 21.
- 2018 Nature van den Eijnden J., Degenaar N., Russell T. D., Miller-Jones J. M., Wijnands R., Sivakoff G. R. & **Hernández Santisteban J.V.**, "Discovery of an evolving jet from a super-Eddington accreting X-ray pulsar", 2018, *Nature*, 562, 233.
- 2018 ApJ Tovmassian G., González J. F., Hernández M.S., González-Buitrago D., Zharikov S., & **Hernández Santisteban J.V.** , "Quest for the donor star in the magnetic pre-cataclysmic variable V1082 Sgr", 2018, *ApJ*, 869, 22..
- 2018 MNRAS van den Eijnden, J., Degenaar N., Pinto C., Patruno A., Wette K., Messenger C., **Hernández Santisteban J.V.** et al., "The very-faint X-ray binary IGR J17062-6143: a truncated disk, no pulsations and a possible outflow", 2017, *MNRAS*, 475, 2027
- 2016 MNRAS Shaw, A. W. and Charles, P. A. and Casares, J. and **Hernández Santisteban J.V.**, "No evidence for a low-mass black hole in Swift J1753.5-0127", 2016, *MNRAS*, 463, 1314.
- 2016 MNRAS Gandhi, P., Littlefair, S. P., Hardy, L. K., Dhillon, V. S., Marsh, T. R., Shaw, A. W., Altamirano, D., Caballero-Garcia, M. D., Casares, J., Casella, P., Castro-Tirado, A. J., Charles, P. A., Dallilar, Y., Eikenberry, S., Fender, R. P., Hynes, R. I., Knigge, C., Kuulkers, E., Mooley, K., Muñoz-Darias, T. Pahari, M., Rahoui, F.; Russell, D. M.; **Hernández Santisteban J.V.**, Shahbaz, T., Terndrup, D. M., Tomsick, J. & Walton, D. J., "Furiously Fast and Red: Sub-second Optical Flickering in V404 Cyg during the 2015 Outburst Peak", 2016, *MNRAS*, 459, 554.
- 2016 MNRAS Echevarría J., Michel R., A. Ramírez-Torres & **Hernández Santisteban J.V.**, "A radial velocity study of the intermediate polar EX Hydrae", 2016, *MNRAS*, 461, 1576.
- 2013 MNRAS Michel R., Echevarría J. & **Hernández Santisteban J.V.**, "Photometry of the eclipsing cataclysmic variable SDSS J152419.33+220920.0", 2013, *A&A*, 554, 25, 4.
- 2011 MNRAS Arellano Ferro A., Figuera Jaimes R., Giridhar Sunetra, Bramich D.M., **Hernández Santisteban J.V.**, Kuppuswamy K. , "Exploring the variable stars in the globular cluster NGC 5024 (M53): New RR Lyrae and SX Phoenixis stars", 2011, *MNRAS*, 416, 2265

### Astronomer's Telegrams, Research Notes & Conference Proceedings

- 2019 Atel Domcek, V., van den Eijnden, J., Rouco Escorial, A., **Hernández Santisteban J.V.**, Degenaar, N., Wijnands, R., Parikh, A., Zhou, P. & Vink, J "Serendipitous detection of a new outburst of the HMXB IGR J19294+1816 with XMM-Newton", 2019, *The Astronomer's Telegram*, 13215.
- 2019 RNAAS Rouco Escorial, A., **Hernández Santisteban J.V.**, Echevarría J., Wijnands, R., Page D. & Degenaar, N., "Spectral evolution of the gamma-ray binary PSR J2032+4127/MT91 213 towards its 2017 periastron passage", 2019, *RNAAS*, 3, 31.
- 2018 Atel van den Eijnden, J. , Degenaar, N., Russell, T. , Wijnands, R. , **Hernández Santisteban J.V.**, Russell D. M., AlMannaei, A. , Maitra, D. , Shaw, A. W., Heinke, C. O. , Sivakoff, G. R. , Maccarone, T., Miller-Jones, J. , Padilla, M. Armas & Bahramian, A., "X-ray re-brightening of the accreting millisecond X-ray pulsar IGR J17379-3747", 2018, *The Astronomer's Telegram*, 11520.

- 2017 van den Eijnden, J., Degenaar, N., Russell, T., Wijnands, R., **Hernández Santisteban J.V.**, Sivakoff, Atel G., Heinke, C., Miller-Jones, J., Bahramian, A., Maccarone, T., Kennea, J. A. & Knigge, C., "VLA radio detection of the newly discovered transient and super-Eddington X-ray pulsar Swift J0243.6+6124", 2017, The Astronomer's Telegram, 10946.
- 2012 **Hernández Santisteban J.V.**, "New Spectroscopic and Photometric Observations of Cataclysmic Variable J0644+3344", 2012, in The Golden Age of Cataclysmic Variables and Related Objects, F. Giovannelli & L. Sabau-Graziati (eds.), Mem. SAIt. 83 N.2.
- 2008 Farah A., González J.J., Sierra G., **Hernández J.V.**, et al., *Thermal Gradients Analysis for ESOPO Spectrograph*. In Ground-based and Airborne Instrumentation for Astronomy II, Proceedings of the SPIE, PAPER NO. 7014-255, Marseille, France., Presented at the Society of Photo-Optical Instrumentation Engineers (SPIE) Conference, 2008.

## Observing Programs

### Approved as Principal Investigator

- Las Cumbres Observatory 2020B Key Project, "Intensive Disk Reverberation Mapping of Nearby Active Galactic Nuclei"
- Isaac Newton Telescope/WFC Cycle 19B, "Feedback in low-mass X-ray binaries: Searching for H $\alpha$  nebulae using the INT/WFC"
- VLA - GO 18B, "Outflows from a quiescent accreting white dwarf binary"
- Isaac Newton Telescope/IDS Cycle 18B, "Revealing the accretion inflow and outflow of the eclipsing nova-like IPHAS J051814.33+294113.0"
- Hubble Space Telescope - DDT Cycle 24, "Characterising the global accretion inflow variability for PSR J1023+0038"
- NOAO Las Cumbres Observatory - 2017A, "Time-resolved photometry of sub-luminous X-ray binaries"
- Very Large Telescope/X-Shooter - Period 101A, "Detection of a sub-stellar donor in a metal-poor halo binary candidate"
- Very Large Telescope/X-Shooter - Period 99A, "Direct Detection of a sub-stellar donor star in an interacting binary"
- Very Large Telescope/X-Shooter - Period 96A, "V458 Vul: Is the nova inside a planetary nebula a Type Ia SN progenitor?"

### Approved as co-Principal Investigator

- Isaac Newton Telescope/WFC Cycle 18B, "Feedback in low-mass X-ray binaries: Searching for H $\alpha$  nebulae using the INT/WFC"
- VLA - DDT 18A, "Jet outflows from a magnetic propeller in an X-ray pulsar"
- Magellan/FIRE - 2018A, "Understanding accretion processes in neutron star X-ray binaries"
- XMM-Newton - AO-17, "The nature of the compact accretor in exotic X-ray binaries"
- Hubble Space Telescope - DDT Cycle 24, "The accretion flow and evolutionary history of an intriguing short-period black hole X-ray binary"
- Hubble Space Telescope - DDT Cycle 21, "Time-Resolved Ultraviolet Spectroscopy of the Missing Link Pulsar/LMXB PSR J1023"
- Very Large Telescope/X-Shooter - Period 101A, "Finding the counterpart of an elusive accreting neutron star to unravel its evolutionary history"
- Swift - Cycle 14, "Detecting an outburst of the Rapid Burster to identify its nIR counterpart"
- OAN/SPM - Cycle 2017B, "Follow-up of active compact binaries of long orbital periods"
- OAN/SPM - Ciclo 2017B-ToO, "Multi-wavelength follow-up *Swift-RATIR* of the dwarf nova candidate MASTER 075353.88+174907.6"