

## HECTOR OKADA DA SILVA

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PERSONAL AND CONTACT INFORMATION	<p><i>Name:</i> Hector Okada da Silva <i>Citizenship:</i> Brazilian</p> <p>University of Illinois at Urbana-Champaign Department of Physics Loomis Laboratory of Physics, Room 390Z Urbana, IL 61801 USA</p> <p>E-mail: <a href="mailto:hosilva@illinois.edu">hosilva@illinois.edu</a> Website: <a href="http://www.phy.olemiss.edu/hosilva">www.phy.olemiss.edu/hosilva</a></p>
RESEARCH INTERESTS	<p><b>Classical gravity:</b> Classical aspects of relativistic gravity (general relativity and modified theories). Structure, stability and dynamics of neutron stars and black holes, including gravitational waves. Tests of gravity in the strong-field regime. Equation of state of neutron stars.</p>
EMPLOYMENT	<p><b>University of Illinois at Urbana-Champaign</b>, Urbana, IL, USA</p> <p>Department of Physics August 2019 – <i>Ongoing</i></p> <ul style="list-style-type: none"><li>• Position: post-doctoral researcher</li><li>• Supervisor: <a href="#">Nicolás Yunes</a></li></ul> <p><b>Montana State University</b>, Bozeman, MT, USA</p> <p>Department of Physics August 2017 – August 2019</p> <ul style="list-style-type: none"><li>• Position: post-doctoral researcher</li><li>• Supervisor: <a href="#">Nicolás Yunes</a></li></ul>
EDUCATION	<p><b>University Mississippi</b>, Oxford, MS, USA</p> <p>PhD., <a href="#">Department of Physics and Astronomy</a> May 2017</p> <ul style="list-style-type: none"><li>• Title: <i>Compact objects in relativistic theories of gravity</i></li><li>• Supervisor: <a href="#">Emanuele Berti</a></li></ul> <p><b>Federal University of Pará</b>, Belém, PA, Brazil</p> <p>M.Sc., <a href="#">Graduate Program in Physics</a>, January 2011</p> <ul style="list-style-type: none"><li>• Title: <i>Dynamical Casimir effect in 1+1 dimensions</i></li><li>• Supervisors: <a href="#">Danilo T. Alves</a> and <a href="#">Carlos Farina</a></li></ul> <p>B.Sc., <a href="#">Department of Physics</a>, December 2008</p> <ul style="list-style-type: none"><li>• Title: <i>Exact solution for the energy density inside a non-stationary cavity with an arbitrary initial field state and applications</i></li><li>• Supervisor: <a href="#">Danilo T. Alves</a></li></ul>
AWARDS, HONORS & SCHOLARSHIPS	<p>[1] <a href="#">The 2017 GWIC-Braccini Thesis Prize</a>, Gravitational Wave International Committee (2019).</p> <p>[2] <a href="#">NAOJ Visiting Joint Research</a> travel grant, National Astronomical Observatory of Japan (2018).</p> <p>[3] <a href="#">Dissertation Fellowship</a> – Spring 2017, University of Mississippi (2016).</p> <p>[4] <a href="#">Graduate Achievement Award</a>, University of Mississippi (2016).</p> <p>[5] <a href="#">Elected member of the Sigma Pi Sigma</a>, the Physics Honor Society (2016).</p> <p>[6] <a href="#">The Blue Apple Award</a> [For best student talk at the <a href="#">8th Gulf Coast Gravity Meeting</a>, University of Florida], <a href="#">American Physical Society Topical Group in Gravitation</a> (2015).</p>

- [7] Summer Research Assistantship, Graduate School, University of Mississippi (2015).
- [8] University of Mississippi, Department of Physics and Astronomy, *Zdravko Stipcevic Honors Fellowship* (2012 – 2015).
- [9] National Council for Scientific and Technological Development (CNPq) Scholarship , (2009 – 2011).
- [10] Foundation for Research Support of the State of Pará (FAPESPA) Scholarship, (2008 – 2009).
- [11] National Council for Scientific and Technological Development (CNPq) Scholarship , (2006 – 2008).

REFEREED JOURNAL As of February 2019, my publications have gathered a total of 1252 citations and I have a *h-index* of  
PUBLICATIONS 16 according to the inSpire database. For the most up-to-date statistics see my [profile](#) in inSpire.

- [1] D. T. Alves, E. R. Granhen, H. O. Silva and M. G. Lima, *Quantum radiation force on the moving mirror of a cavity, with Dirichlet and Neumann boundary conditions for a vacuum, finite temperature, and a coherent state*, *Phys. Rev. D* **81** 025016 (2010).
- [2] D. T. Alves, E. R. Granhen, H. O. Silva and M. G. Lima, *Exact behavior of the energy density inside an one-dimensional oscillating cavity with a thermal state*, *Phys. Lett. A* **374** 3899-3907 (2010) [[arXiv:1002.2238](#)].
- [3] H. O. Silva and C. Farina, *Simple model for the dynamical Casimir effect for a static mirror with time-dependent properties*, *Phys. Rev. D* **84** 045003 (2011) [[arXiv:1102.2238](#)].
- [4] A. L. C. Rego, H. O. Silva, D. T. Alves and C. Farina, *New signatures of the dynamical Casimir effect in a superconducting circuit*, *Phys. Rev. D* **90** 025003 (2014) [[arXiv:1405.3720](#)].
- [5] H. O. Silva, H. Sotani, E. Berti and M. Horbatsch, *Torsional oscillations of neutron stars in scalar-tensor theory of gravity*, *Phys. Rev. D* **90** 124044 (2014) [[arXiv:1410.2511](#)].
- [6] H. O. Silva, C. F. B. Macedo, E. Berti and L. C. B. Crispino, *Slowly rotating anisotropic neutron stars in general relativity and scalar-tensor theory*, *Class. Quantum Grav.* **32** 145008 (2015) [[arXiv:1411.6286](#)], (Chosen as **IOPSELECT**)
- [7] K. Glampedakis, G. Pappas, H. O. Silva and E. Berti, *Post-Tolman-Oppenheimer-Volkoff formalism for relativistic stars*, *Phys. Rev. D* **92** 024056 (2015) [[arXiv:1504.02455](#)].
- [8] M. Horbatsch, H. O. Silva, D. Gerosa, P. Pani, E. Berti, L. Gualtieri and U. Sperhake, *Tensor-multi-scalar theories: relativistic stars and 3+1 decomposition*, *Class. Quantum Grav.* **32** 204001 (2015) [[arXiv:1505.07462](#)], (Chosen as **IOPSELECT**)
- [9] A. Maselli, H. O. Silva, M. Minamitsuji and E. Berti, *Slowly rotating black hole solutions in Horndeski gravity*, *Phys. Rev. D* **92** 104049 (2015) [[arXiv:1508.03044](#)].
- [10] H. O. Silva, H. Sotani and E. Berti, *Low-mass neutron stars: universal relations, the nuclear symmetry energy and gravitational radiation*, *MNRAS* **459** 4378 (2016) [[arXiv:1601.03407](#)].
- [11] A. Maselli, H. O. Silva, M. Minamitsuji and E. Berti, *Neutron stars in Horndeski gravity*, *Phys. Rev. D* **93** 124056 (2016) [[arXiv:1603.04876](#)].
- [12] M. Minamitsuji and H. O. Silva, *Relativistic stars in scalar-tensor theories with disformal coupling*, *Phys. Rev. D* **93** 124041 (2016) [[arXiv:1604.07742](#)].
- [13] K. Glampedakis, G. Pappas, H. O. Silva and E. Berti, *Astrophysical application of the Post-Tolman-Oppenheimer-Volkoff formalism*, *Phys. Rev. D* **94** 044030 (2016) [[arXiv:1606.05106](#)] (Featured as **EDITORS'S SUGGESTION**).
- [14] K. Glampedakis, G. Pappas, H. O. Silva and E. Berti, *Post-Kerr black hole spectroscopy*, *Phys. Rev. D* **96** 064054 (2017) [[arXiv:1706.07658](#)].

- [15] H. O. Silva and N. Yunes, *I-Love-Q to the extreme*, *Class. Quantum Grav.* **35** 015005 (2017) [[arXiv:1710.00919](#)]
- [16] J. Alsing, H. O. Silva and E. Berti, *Evidence for a maximum mass cut-off in the neutron star mass distribution and constraints on the equation of state*, *MNRAS* **478** 1377 (2018) [[arXiv:1709.07889](#)]
- [17] H. O. Silva, J. Sakstein, L. Gualtieri, T. P. Sotiriou and E. Berti, *Spontaneous scalarization of black holes and compact stars from a Gauss-Bonnet coupling*, *Phys. Rev. Lett.* **120** 131104 (2018) [[arXiv:1711.02080](#)]
- [18] H. O. Silva and N. Yunes, *Neutron star pulse profiles in scalar-tensor theories of gravity*, *Phys. Rev. D* **99** 044034 (2019) [[arXiv:1808.04391](#)]
- [19] H. O. Silva, C. F. B. Macedo, T. P. Sotiriou, L. Gualtieri, J. Sakstein and E. Berti, *Stability of scalarized black hole solutions in scalar-Gauss-Bonnet gravity*, *Phys. Rev. D* **99** 064011 (2019) [[arXiv:1812.05590](#)]
- [20] C. F. B. Macedo, J. Sakstein, E. Berti, L. Gualtieri, H. O. Silva and T. P. Sotiriou, *Self-interactions and Spontaneous Black Hole Scalarization* *Phys. Rev. D* **99**, 104041 (2019) [[arXiv:1903.06784](#)]
- [21] H. O. Silva and N. Yunes, *Neutron star x-ray burst oscillations as extreme gravity probes*, *Class. Quantum Grav.* **36**, 17LT01 (2019) [[arXiv:1902.10269](#)]
- [22] H. Sotani, H. O. Silva and G. Pappas, *Finite size effects on the light curves of slowly-rotating neutron stars* *Phys. Rev. D* **100**, 043006 (2019) [[arXiv:1905.07668](#)]
- [23] A. Saffer, H. O. Silva and N. Yunes, *The exterior spacetime of relativistic stars in scalar-Gauss-Bonnet gravity* *Phys. Rev. D* **100**, 044030 (2019) [[arXiv:1903.07779](#)]
- [24] K. Glampedakis and H. O. Silva, *Eikonal quasinormal modes of black holes beyond general relativity* *Phys. Rev. D* **100**, 044040 (2019) [[arXiv:1906.05455](#)]
- [25] H. O. Silva and N. Yunes, *More than the sum of its parts: combining parameterized tests of extreme gravity* *Phys. Rev. D* **100**, 084034 (2019) [[arXiv:1906.00485](#)]
- [26] R. Nair, S. Perkins, H. O. Silva and N. Yunes, *Fundamental physics implications on higher-curvature theories from the binary black hole signals in the LIGO-Virgo Catalog GWTC-1* *Phys. Rev. Lett.* **123**, 191101 (2019), *Phys. Rev. Lett.* **124**, 169904(E) (2020) [[arXiv:1905.00870](#)]
- [27] H. O. Silva and M. Minamitsuji, *Cosmological attractors to general relativity and spontaneous scalarization with disformal coupling* *Phys. Rev. D* **100**, 104012 (2019) [[arXiv:1909.11756](#)]
- [28] H. O. Silva and K. Glampedakis, *Eikonal quasinormal modes of black holes beyond general relativity II: generalized scalar-tensor perturbations* *Phys. Rev. D* **101**, 044051 (2020) [[arXiv:1912.09286](#)]

PUBLICATIONS  
ACCEPTED OR IN  
REVIEW

- [29] H. O. Silva, A. Miguel Holgado, Alejandro Cárdenas-Avendaño and Nicolás Yunes, *Astro-physical and theoretical physics implications from multimessenger neutron star observations* [[arXiv:2004.01253](#)]
- [30] H. O. Silva, George Pappas, Nicolás Yunes and Kent Yagi, *The surface of rapidly-rotating neutron stars: implications to neutron star parameter estimation* [[arXiv:2008.05565](#)]
- [31] Carlos A. R. Herdeiro, Eugen Radu, Hector O. Silva, Thomas P. Sotiriou and Nicolás Yunes, *Spin-induced scalarized black holes* [[arXiv:2009.03904](#)]

REVIEW PAPERS

- [32] E. Berti, [47 authors], H. O. Silva, [5 authors], *Testing general relativity with present and future astrophysical observations*, *Class. Quantum Grav.* **32** 243001 (2015) [[arXiv:1501.07274](#)].

PUBLICATIONS IN  
CONFERENCE  
PROCEEDINGS

- [33] D. T. Alves, E. R. Granhen, M. G. Lima, H. O. Silva and A. R. L. Rego, *Time evolution of the energy density inside a one-dimensional non-static cavity with a vacuum, thermal and a coherent state*, *J. Phys.: Conf. Ser.* **161** 012032 (2009) [[arXiv:0903.1305](#)] (Contribution to the proceedings of the 60 years of the Casimir effect conference).
- [34] C. Farina, H. O. Silva, A. L. C. Rego and D. T. Alves, *Time-dependent Robin boundary conditions in the dynamical Casimir effect*, *Int. J. Mod. Phys. Conf. Ser.* **14** 306 (2012) [[arXiv:1201.3846](#)] (Contribution to the proceeding of the 10th Quantum Field Theory Under the Influence of External Conditions conference).
- [35] H. O. Silva, A. Maselli, M. Minamitsuji and E. Berti, *Compact objects in Horndeski gravity*, *Int. J. Mod. Phys. D* **25** 1641006 (2016) [[arXiv:1602.05997](#)] (Contribution to the proceedings of the 3rd Amazonian Symposium on Physics and 5th NRHEP Network Meeting ).

BOOK CHAPTERS

- [1] A. L. C. Rego, D. T. Alves, E. R. Granhen, H. O. Silva, M. G. Lima and W. P. Pires, *The Dynamical Casimir Effect*, in *Trends in Physics - Festschrift in homage to Prof. José Maria Filardo Bassalo*. Eds. M. S. D. Cattani, L. C. B. Crispino, M. O. C. Gomes and A. F. S. Santoro, (Editora Livraria da Física, São Paulo, 2009).

MEDIA & PRESS

Some of my work has been featured in media and press:

- [1] Remya Nair, “[Testing Einstein when gravity waves](#)”  
Story on the paper [\[26\]](#), July 2, 2020.
- [2] Edwin B. Smith, “[Physics Alumnus Wins International Award for Gravitational Wave Thesis](#)”  
Story on the 2017 GWIC-Braccini Thesis Award, June 25, 2019.
- [3] Claire Fullerton, “[Gravity and scalar fields: live long and prosper?](#)”  
Invited contribution to [CQG+](#) based on publication [\[8\]](#), October 14, 2015.
- [4] Rafael Rocha, “[Pesquisa em Física ganha destaque em revista internacional](#)”  
Interview for the Federal University of Pará website on publication [\[6\]](#), September, 2015.
- [5] Claire Fullerton, “[Spontaneous scalarization: dead or alive?](#)”  
Invited contribution to [CQG+](#) based on publication [\[6\]](#), September 23, 2015.

CONFERENCE,  
INVITED TALKS AND  
COLLOQUIUM  
PRESENTATIONS

- [1] H. O. Silva *Neutron stars: equation of state and gravitational theory*, [invited](#) at the Nuclear Physics Journal Club, USA (2020).
- [2] H. O. Silva *Neutron stars as laboratories for fundamental physics*, [invited](#) departmental colloquium at *Kent State University* in Ohio, USA (2020).
- [3] H. O. Silva *Scalar fields and compact objects* Astrophysics, Gravitation and Cosmology Seminar at *University of Illinois at Urbana-Champaign*, in Illinois, USA (2019).
- [4] H. O. Silva *Probing extreme gravity with x-ray burst oscillations* at the *GR22/Amaldi13 Conference* in Valencia, Spain (2019).
- [5] H. O. Silva *Spontaneous black hole scalarization* at the *GR22/Amaldi13 Conference* in Valencia, Spain (2019).
- [6] H. O. Silva *Parametrized tests of gravity: from stellar structure to gravitational waves* at the *GR22/Amaldi13 Conference* in Valencia, Spain (2019).
- [7] H. O. Silva *Probing extreme gravity with NICER*, [invited](#) talk at the *APS April Meeting 2019* in Denver, USA (2019).
- [8] H. O. Silva *The shape of rotating neutron stars and systematic errors in pulse profile observations parameter estimation* at the *APS April Meeting 2019* in Denver, USA (2019).

- [9] H. O. Silva, *Scalar fields and strong-field gravity*, [invited](#) talk at the Institut d’Astrophysique de Paris, France (2019).
- [10] H. O. Silva, *Scalar fields and strong-field gravity*, talk at *RelAstro* at Montana State University, USA (2018).
- [11] H. O. Silva, *Scalar fields and strong-field gravity: spontaneous scalarization of compact objects*, [invited](#) talk at the Kavli Institute for Cosmological Physics, University of Chicago, USA (2019).
- [12] H. O. Silva, *Illuminating the strong-field regime of gravity*, talk at *RelAstro* at Montana State University, USA (2018).
- [13] H. O. Silva, *Illuminating the strong-field regime of gravity*, [invited](#) talk at the National Astronomical Observatory of Japan, Japan (2018).
- [14] H. O. Silva, *A física extrema da estrelas de nêutrons*, [invited](#) talk at Universidade Federal do Pará, Brazil (2018).
- [15] H. O. Silva, *Estrelas de nêutrons: laboratórios celestes para física fundamental*, [invited](#) talk at Universidade Federal do Pará, Brazil (2018).
- [16] H. O. Silva, *I-Love-Q to the extreme*, talk at *RelAstro* at Montana State University, USA (2018).
- [17] H. O. Silva, *Neutron star masses: from astro to fundamental physics*, talk at *RelAstro* at Montana State University, USA (2017).
- [18] H. O. Silva, *Probing the strong-field regime of gravity with neutrons stars*, [invited](#) talk at Montana State University, USA (2017).
- [19] H. O. Silva, K. Glampedakis, G. Pappas and E. Berti *Applications of the post-Tolman-Oppenheimer-Volkoff formalism*, at the *APS April Meeting 2017* in Washington DC, USA (2017).
- [20] H. O. Silva, M. Minamitsuji *Relativistic stars in scalar-tensor theories with disformal coupling*, at the *APS April Meeting 2017* in Washington DC, USA (2017).
- [21] H. O. Silva, *Confronting scalar-tensor theories of gravity against binary-pulsar observations*, at the *II Physics Graduate Student Research Symposium* in Oxford, USA (2016).
- [22] H. O. Silva, *Neutron stars in scalar-tensor theories of gravity*, [invited](#) talk at Universidade de Lisboa in Lisbon, Portugal (2016).
- [23] H. O. Silva, *Neutron stars in scalar-tensor theories of gravity*, [invited](#) talk at Universidade de Aveiro in Aveiro, Portugal (2016).
- [24] H. O. Silva, *Neutron stars in scalar-tensor theories of gravity*, [invited](#) talk at Instituto Superior Técnico in Lisbon, Portugal (2016).
- [25] H. O. Silva, *Low-mass neutron stars: universal relations, the nuclear symmetry energy and gravitational radiation* at the *APS April Meeting*, in Salt Lake City, USA (2016).
- [26] H. O. Silva, *Neutron stars as strong gravity probes*, [invited](#) talk at Mississippi State University’s Journal Club in Starkville, USA (2015).
- [27] H. O. Silva, A. Maselli, M. Minamitsuji and E. Berti, *Slowly rotating black hole solutions in Horndeski gravity*, at the *III Amazonian Symposium on Physics and V NRHEP Network Meeting* in Belém, Brazil (2015).
- [28] H. O. Silva, E. Berti, K. Glampedakis and G. Pappas, *Testing general relativity with neutron stars: a new parametrized formalism*, at the *UM Research Day* in Oxford, USA (2015).
- [29] H. O. Silva, *No-hair theorems in Horndeski gravity*, at the *Physics Graduate Student Research Symposium* in Oxford, USA (2015).

CONFERENCE  
POSTERS

- [30] H. O. Silva, E. Berti, K. Glampedakis and G. Pappas, *A post-TOV formalism for relativistic stars*, at the *IV NRHEP Network Meeting* in Rome, Italy (2015).
- [31] H. O. Silva, *Tests of strong gravity with neutron star*, at the *(Non-)universal properties of neutron stars* in Bremen, Germany (2015).
- [32] H. O. Silva, E. Berti, K. Glampedakis and G. Pappas, *A post-TOV formalism for relativistic stars*, at the *8th Gulf Coast Gravity Meeting* in Gainesville, USA (2015).
- [33] C. Farina and H. O. Silva, *Dynamical Casimir effect without moving mirrors*, at the *V Week of the Federal University of Pará Graduate Program in Physics* in Belém, Brazil (2010).
- [34] J. S. S. Júnior and H. O. Silva, *Zeta Functions and the Casimir effect*, at the *IV Week of the Federal University of Pará Graduate Program in Physics* in Belém, Brazil (2009).
- [35] H. O. Silva, *Schwinger's method for calculating non-relativistic propagators in quantum mechanics*, at the *Journal Club* in Belém, Brazil (2009).
- [36] D. T. Alves, H. O. Silva and A. N. Braga, *Quantum vacuum effects*, at the *Physics Freshman Week of Federal University of Pará* in Belém, Brazil (2008).
- [37] H. O. Silva and D. T. Alves, *Quantum field theory in spaces with boundaries with emphasis on the dynamical Casimir effect*, at the *XIV Seminar of Undergraduate Research of Federal University of Pará* in Belém, Brazil (2008).
- [38] H. O. Silva and D. T. Alves, *Quantum field theory in spaces of boundaries*, at the *XVIII Seminar of Undergraduate Research of Federal University of Pará* in Belém, Brazil (2007).
- [39] H. O. Silva and D. T. Alves, *Quantum field theory in the presence of boundaries*, at the *XVII Seminar of Undergraduate Research of Federal University of Pará* in Belém, Brazil (2006).
- [1] K. Glampedakis, G. Pappas, H. O. Silva and E. Berti, *A post-TOV formalism for relativistic stars*, at the *Compact Objects as Astrophysical and Gravitational Probes* in Leiden, Netherlands (2015).
- [2] H. O. Silva, H. Sotani, E. Berti and M. Horbatsch, *Torsional oscillations of neutron stars in scalar-tensor theory*, at the *GR@99* in Bad Honnef, Germany (2014).
- [3] A. L. C. Rego, C. Farina, H. O. Silva and D. T. Alves, *Dynamical Casimir effect with time dependent Robin boundary conditions in 3+1 dimensions*, at the *Physics Meeting* in Foz do Iguaçu, Brazil (2010).
- [4] J. S. S. Júnior and H. O. Silva, *Casimir effect with soft boundary conditions at finite temperature*, at the *II Amazonian School on Quantum Theory and Applications* in Belém, Brazil (2010).
- [5] J. S. S. Júnior and H. O. Silva, *Mass and temperature corrections to the Casimir effect*, at the *XXVII Meeting of Physicists from North and Northeast* in Belém, Brazil (2009).
- [6] D. T. Alves, E. R. Granhen, H. O. Silva and M. G. Lima, *Quantum radiation force on the mirrors of a non-static cavity, with Dirichlet and Neumann boundary conditions for a vacuum, finite Temperature and coherent state*, at the *Workshop on Quantum Nonstationary Systems* in Brasília, Brazil (2009).
- [7] J. S. S. Júnior, H. O. Silva and D. T. Alves, *Casimir effect and lattice regularization*, at the *V Undergraduate Research Journey of the Program of Tutorial Education of Pará* in Belém, Brazil (2009).
- [8] H. O. Silva, C. F. B. Macedo and L. C. B. Crispino, *Solution of the one-dimensional Schrödinger equation for a particle in an infinite potential well in a discrete spacetime*, at the *V Undergraduate Research Journey of the Program of Tutorial Education of Pará* in Belém, Brazil (2009).



## VISITS

### Long scientific visits:

- [1] **National Astronomical Observatory of Japan** September – October 2018  
 Visited the Division of Theoretical Astronomy of the National Astronomical Observatory of Japan and collaborated with Hajime Sotani. Visit resulted in the publication [22].  
 Host: Hajime Sotani.
- [2] **Universidade Federal do Pará** June 2018  
 Visited the Departamento de Física and the Faculdade de Ciências of the Universidade Federal do Pará, Belém and Salinópolis campuses.  
 Hosts: Luis C. B. Crispino and Caio F. B. Macedo
- [3] **University of Nottingham** May – July 2017  
 Visited the University of Nottingham and collaborated with Prof. Thomas P. Sotiriou. Collaboration resulted in the publication [17].  
 Host: Thomas P. Sotiriou.
- [4] **Instituto Superior Técnico** April – July 2016  
 Visited the Gravitation at Técnico (GRIT) group, led by Prof. Vitor Cardoso. Collaboration resulted in the publications [12] and [13].  
 Host: Vitor Cardoso.
- [5] **Instituto Superior Técnico** May – July 2015  
 Visited the Gravitation at Técnico (GRIT) group, led by Prof. Vitor Cardoso. Collaboration resulted in the publication [9].  
 Host: Vitor Cardoso.
- [6] **Federal University of Rio de Janeiro** January – July 2010  
 I was an exchange student visiting the Physics Institute. I attended a graduate level special topics course on quantum vacuum effects. Collaboration with the group of Prof. Carlos Farina resulted in the publication [3].  
 Host: Carlos Farina.

## MENTORING

- [1] **Reagan Cox**  
 Undergraduate student in physics, Montana State University, USA.  
 Project: *Neutron stars in massive scalar-tensor gravity*.  
 Primary adviser: Nicolás Yunes.  
 Period: 2017–ongoing.
- [2] **Tanísia de Fátima de Moraes Cardoso**  
 Undergraduate student in physics, Federal University of Pará, Brazil.  
 Project: *Path integrals in quantum mechanics*.  
 Primary adviser: Silvana Perez.  
 Period: 2009–2010.
- [3] **Jocivaldo Siqueira da Silva Júnior**  
 Undergraduate student in physics, Federal University of Pará, Brazil.  
 Project: *Casimir Effect: static and dynamical*.  
 Primary adviser: Danilo T. Alves.  
 Period: 2009–2011.
- [4] **Monique Valério Silva**  
 High-school student, Federal University of Pará, Brazil  
 Project: *Studies on mechanics in high-school with the aid of computational techniques*.  
 Primary adviser: Luis Carlos Bassalo Crispino.  
 Period: 2009.

TEACHING  
EXPERIENCE

University of Mississippi, Oxford, MS, USA

*Grader*

August – December 2015

- Graded assignments for graduate level course in general relativity (PHYS 729).
- Main instructor: [Luca Bombelli](#).

*Grader*

August – December 2015

- Graded assignments for introductory astronomy class (ASTR 103).
- Main instructor: James Hill.

*Teaching Assistant*

August 2012 – July 2014

- PHYS 221 and 222: Laboratory Physics for Science and Engineering.
  - Undergraduate course in introductory laboratory physics for science and engineering majors.
  - I worked as a teaching assistant of two sections ( $\sim 50$  students) per semester during this period. I was responsible for engaging the student in the laboratory activities and grading their assignments (weekly experiment reports and tests). I also served as a tutor (2 hrs/week) helping undergraduate students with their classwork.
- Laboratory Physicists: [Thomas Jamerson](#).

PROFESSIONAL  
SERVICE

**Referee**

I have served as a referee for the following scientific journals [where ( $n$ ) indicates the number of refereed manuscripts]:

- *Physical Review D* ..... (13),
- *International Journal of Modern Physics D* ..... (3),
- *General Relativity and Gravitation* ..... (2),
- *Physical Review Letters* ..... (2),
- *Universe* ..... (2),
- *The Astrophysical Journal* ..... (1),
- *Classical and Quantum Gravity* ..... (1),
- *European Journal of Physics C* ..... (1),
- *International Journal of Modern Physics E* ..... (1),
- *Modern Physics Letters A* ..... (1),
- *Monthly Notices of the Royal Astronomical Society* ..... (1),
- *Physical Review E* ..... (1),
- *Physics* ..... (1),
- *Particles* ..... (1),

**Judging committees**

I participated in the following undergraduate thesis defense:

- [1] Tanísia de Fátima de Moraes Cardoso, 2010  
Undergraduate student in Physics, Federal University of Pará,  
Title: *Path integrals in quantum mechanics*.

PROFESSIONAL  
MEMBERSHIPS

I am a member of the following organizations:

- [Sociedade Brasileira de Física](#).
- [American Physical Society](#).
  - [Division of Gravity](#).
- [Sigma Pi Sigma](#).

OUTREACH AND  
SERVICE

**arXiv.BR**

Since 2014

- I maintain and run the Twitter account `arxiv_br` since 2014. The account shares papers by Brazilian scientists (and foreigners at Brazilian institutions) which have been posted to the arXiv the gr-qc, astro-ph and hep-th sections. I also regularly post threads on the history of science in



Brazil and the latest events in the field of gravitational physics in Portuguese. As of February 2020, the account has 817 followers, many of whom are lay people and physics students. The account regularly interacts with the Twitter accounts of major Brazilian institutions such as the [Centro Brasileiro de Pesquisas Físicas](#) and the [Academia Brasileira de Ciências](#).

#### **Memória da Física Brasileira**

Since March 2019

- I maintain and run the website *Memória da Física Brasileira* (Memory of the Brazilian Physics). In this website I write biographies of Brazilian physicists and accounts on events in the history of physics in Brazil. I also keep a database of material related on this topic. Currently (March 2019) the project is in its early stages. The goal is to ultimately have a website in the style of the [MacTutor History of Mathematics archive](#) but focused on Brazilian physics.

#### **Federal University of Pará**

2009 – 2011

##### **Student representative**

- During the academic years of 2009–2010 and 2010–2011, I was one of the two student representatives at the graduate program in physics at the Federal University of Pará. My role was to act as an active voice representing the students and participating in decisions concerning the graduate program.

#### **2015 MS Region VII Science Fair**

March 2015

- Judge of the science fair projects in the “Lower Fair” session.

#### **University of Mississippi,**

April 2015 – January 2016

##### **Physics Graduate Student Association (PGSA)**

- I am a founding member of the PGSA at University of Mississippi. PGSA’s goal is to stimulate the interaction among the physics student, through events and social activities. During the period from April 2015 to January 2016 I served as vice-president.

## ORGANIZATION

#### **1st School of the Graduate Program in Physics of the Federal University of Pará,**

January 2011

- Co-organized with Profs. Petrus A. A. Júnior, Danilo T. Alves and Luís C. B. Crispino. This week-long school offered mini-courses, at the advanced undergraduate level, on Electromagnetism, Statistical Mechanics and Quantum Mechanics (and seminars on research topics by the faculty of Federal University of Pará) for university level students in the Belém area, attracting participants from four universities.

#### **Physics Graduate Student Research Symposium,**

September 2015

- Co-organized with other PGSA members. The event consisted of an afternoon with short communications by the student body of the Department of Physics and Astronomy, at University of Mississippi.

#### **1st Annual UM-MSU Joint Physics Research Symposium,**

February 2016

- Co-organized with other PGSA members. The symposium consisted of a day with short communications (and poster presentations) by undergraduate and graduate students from the Departments of Physics and Astronomy from both University of Mississippi and Mississippi State University.

## COMPUTATIONAL SKILLS

### Computer programming and others:

- Python, C++, Gnuplot, L<sup>A</sup>T<sub>E</sub>X, HTML, CSS and Julia.

### Mathematical software:

- Mathematica and Maple.

### Operating systems:

- Microsoft Windows, Mac OSX and Linux.

LANGUAGES            Portuguese (Native), English (Fluent) and Spanish (Basic).

MORE  
INFORMATION        More information can be found in my website  
[www.phy.olemiss.edu/~hosilva](http://www.phy.olemiss.edu/~hosilva).