

André da Silva Schneider

Curriculum Vitae

contact

California Institute of
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languages

portuguese	native
english	fluent
french	advanced
spanish	basic

tools

Fortran	13+ yrs
Unix/Linux	7+ yrs
OpenMP	5+ yrs
OpenACC	2+ yrs
MPI	2+ yrs
LaTeX	10+ yrs
Mathematica	5+ yrs
MESA/GR1D	9+ mos
ParaView	4+ yrs
VMD	6+ yrs
Gnuplot	5+ yrs
Python	10+ mos
Git	9+ mos
Matlab/Maple	familiar
C/C++	familiar

interests

- Nuclear astrophysics
- Neutrino physics
- Numerical simulations
- High performance computing
- Scientific visualization
- Data analysis
- Science teaching
- & outreach

education

- 2008–2013 **Ph.D.** Physics Indiana University Bloomington
Phase Transitions in Stars (successfully defended on 12/06/2013)
Advisor: [Professor Charles J Horowitz](#)
Major: *Nuclear Physics*
Minors: *Condensed Matter and High Energy Physics*
- 2004–2006 **M.Sc.** Physics Federal University of Santa Catarina
A Relativistic Approach to Nuclear Current Transition Densities in Nuclear Quasielastic Electron Scattering (successfully defended on 08/10/2006)
Advisor: [Professor José Ricardo Marinelli](#)
- 2000–2004 **B.Sc.** Physics Federal University of Santa Catarina

research experience

Postdoctoral

- 10/2014 **California Institute of technology** Pasadena - CA - USA
–now Research in Nuclear Astrophysics
• Stellar evolution and collapse.
• Equations of state of nuclear matter.
- 01/2014 **Indiana University Bloomington** Bloomington - IN - USA
–08/2014 Molecular dynamics (MD) simulations of dense plasmas.
Study of observables, topology and visualization of nuclear pasta.

Graduate & Undergraduate

- 05/2009 **Indiana University Bloomington** Bloomington - IN - USA
–12/2013 *Research Assistant*
- 02/2008 **University of Coimbra** Coimbra - Portugal
–08/2008 *Research Assistant*
- 04/2004 **Federal University of Santa Catarina** Florianopolis - SC - Brazil
–08/2006 *Research Assistant*
- 03/2002 **Federal University of Santa Catarina** Florianopolis - SC - Brazil
–03/2004 *Undergraduate Research Assistant*

fellowships & awards

- 2014 **Science without Borders Postdoctoral Fellowship** CNPq - Ministry of Education, Brazil
- 2013 **Outstanding Graduate Student in Theoretical Research** Indiana University Bloomington

teaching experience

- 08/2011 **Indiana University Bloomington** Bloomington - IN - USA
–12/2011 Laboratory Instructor for *General Physics I and II*
08/2008 Supervisor: [Dan Beeker](#)
–05/2010 Grader for *Quantum Field Theory*
Supervisor: [Professor Steven Gottlieb](#)
- 2009–2013 **Indiana University** Bloomington - IN - USA
Physics tutor
Co-advisor to undergraduate researchers (Summer 2012 and 2013)
- 08/2005 **Federal University of Santa Catarina** Florianópolis - SC - Brazil
–12/2005 Teaching Assistant for *Electromagnetic Theory II*
Supervisor: [Professor Carlos Alberto Kuhnen](#)

publications

articles in peer-reviewed journals

- [1] Pasta nucleosynthesis: Molecular dynamics simulations of nuclear statistical equilibrium
M. E. Caplan, **A. S. Schneider**, C. J. Horowitz, D. K. Berry
[Phys. Rev. C 91 065802 \(2015\)](#)
- [2] Disordered Nuclear Pasta, Magnetic Field Decay, and Crust Cooling in Neutron Stars
C. J. Horowitz, D. K. Berry, C. M. Briggs, M. E. Caplan, A. Cumming, **A. S. Schneider**
[Phys. Rev. Lett. 114 031102 \(2015\)](#)
- [3] Nuclear “waffles”
A. S. Schneider, D. K. Berry, C. M. Briggs, M. E. Caplan, C. J. Horowitz
[Phys. Rev. C 90 055805 \(2014\)](#)
- [4] Nuclear “pasta” formation
A. S. Schneider, C. J. Horowitz, J. Hughto, D. K. Berry
[Phys. Rev. C 88 065807 \(2013\)](#)
- [5] Direct molecular dynamics simulation of liquid-solid phase equilibria for a three-component plasma
J. Hughto, C. J. Horowitz, **A. S. Schneider**, Zach Medin, Andrew Cumming, D. K. Berry
[Phys. Rev. E 86 066413 \(2012\)](#)
- [6] Direct molecular dynamics simulation of liquid-solid phase equilibria for two-component plasmas
A. S. Schneider, J. Hughto, C. J. Horowitz, D. K. Berry
[Phys. Rev. E 85 066405 \(2012\)](#)
- [7] Diffusion in Coulomb crystals
J. Hughto, **A. S. Schneider**, C. J. Horowitz, D. K. Berry
[Phys. Rev. E 84 016401 \(2011\)](#)
- [8] Diffusion of neon in white dwarf stars
J. Hughto, **A. S. Schneider**, C. J. Horowitz, D. K. Berry
[Phys. Rev. E 82 066401 \(2010\)](#)
- [9] Compact stars with a quark core within the Nambu–Jona-Lasinio (NJL) model
C. H. Lenzi, **A. S. Schneider**, C. Providência, R. M. Marinho
[Phys. Rev. C 82 015809 \(2010\)](#)

[10] Crystallization of Carbon-Oxygen Mixtures in White Dwarf Stars

C. J. Horowitz, **A. S. Schneider**, D. K. Berry

[Phys. Rev. Lett. 104 231101 \(2010\)](#)

[11] Reexamining the neutron skin thickness within a density dependent hadronic model

S. S. Avancini, J. R. Marinelli, D. P. Menezes, M. M. W. Moraes, **A. S. Schneider**

[Phys. Rev. C 76 064318 \(2007\)](#)

book chapters

[1] Neutron Star Crust and Molecular Dynamics Simulation

C. J. Horowitz, J. Hughto, **A. S. Schneider**, D. K. Berry

Chapter in: Neutron Star Crust, ISBN: 978-1-62081-902-9

C. Bertulani and J. Piekarewicz, eds., Nova Science Publishers, Inc., (2012), Hauppauge, NY

conference proceedings

[1] Phase diagram of carbon-oxygen plasma mixtures in white dwarf stars

A. S. Schneider, C. J. Horowitz, J. Hughto, D. K. Berry

[Journal of Physics: Conference Series vol. 402 012026 \(2012\)](#)

[2] Relativistic Hadronic Models and Parity Violating Lepton Scattering

C. A. Graeff, **A. S. Schneider**, J. R. Marinelli

[International Journal of Modern Physics E vol. 16 3028–3031 \(2007\)](#)

submitted or in preparation

[1] *Parking-garage structures in astrophysics and Biophysics*

C. J. Horowitz, D. K. Berry, M. E. Caplan, Greg Huber, **A. S. Schneider**

[submitted to Phys. Rev. Lett. \(2015\)](#)

[2] *Nuclear "pasta" structure factor and observables*

A. S. Schneider, D. K. Berry, M. E. Caplan, C. J. Horowitz, Z. Lin

[in preparation \(2015\)](#)

conferences & schools

talks & posters

[1] Nuclear Pasta, Crust Cooling and Magnetic Field Decay in Neutron Stars

Invited Talk at: Gordon Research Conference (May 2015) New London - NH, USA

[2] Nuclear Pasta: Topology and Defects

Talk at: April Meeting of the American Physical Society 2015 (Apr. 2015) Baltimore - MD, USA

[3] Nuclear Pasta

Talk at: The 14th Annual Theoretical Astrophysics in Southern California Meeting (Nov. 2014) San Diego - CA, USA

[4] Estudo de plasmas estelares através de simulações de dinâmica molecular

Invited Talk at: Federal University of Santa Catarina (Sept. 2014) Florianópolis - SC, Brazil

[5] Large Scale Molecular Dynamics Simulation of Nuclear Pasta

Poster at: 2014 Scientific Discovery through Advanced Computing (SciDAC-3) Principal Investigator Meeting (July 2014) Washington - DC, USA

[6] Nuclear Pasta

Talk at: April Meeting of the American Physical Society 2014 (*Apr. 2014*) Savannah - GA, USA

[7] Nuclear Pasta Properties from Molecular Dynamics Simulations

Talk at: XXVII Texas Symposium on Relativistic Astrophysics (*Dec. 2013*) Dallas - TX, USA

[8] Dynamics of Nuclear Pasta Phase Transitions

Talk at: Fall Meeting of the APS Division of Nuclear Physics 2013 (*Oct. 2013*) Newport News - VA, USA

[9] Molecular Dynamics of Nuclear Pasta Formation

Poster at: 3rd International Symposium on Nuclear Symmetry Energy (*July 2013*) East Lansing - MI, USA

[10] Nuclear Pasta Formation

Talk at: ICNT2013 (*July 2013*) East Lansing - MI, USA

[11] Molecular Dynamics Simulations of Nuclear Pasta

Talk at: NUCLEI meeting 2013 (*June 2013*) Bloomington - IN, USA

[12] Molecular Dynamics of Nuclear Pasta Formation

Poster at: Gordon Research Conference (*June 2013*) New London - NH, USA

[13] Nuclear Pasta Properties from Molecular Dynamics Simulations

Talk at: April Meeting of the American Physical Society 2013 (*Apr. 2013*) Denver - CO, USA

[14] Molecular Dynamics Simulations of Dense Matter

Invited Talk at: Michigan State University (*Mar. 2013*) East Lansing - MI, USA

[15] Molecular dynamics simulation of nuclear pasta

Talk at: Fall Meeting of the APS Division of Nuclear Physics 2012 (*Oct. 2012*) Newport Beach - CA, USA

[16] Molecular Dynamics of Dense Plasmas

Talk at: National Nuclear Physics Summer School 2012 (*July 2012*) Santa Fe - NM, USA

[17] The carbon-oxygen phase diagram of plasma mixtures in white dwarf stars

Talk at: Conference on Computational Physics 2011 (*Nov. 2011*) Gattlinburg - TN, USA

[18] Chemical separation in accreting neutron stars

Talk at: Fall Meeting of the APS Division of Nuclear Physics 2011 (*Oct. 2011*) East Lansing - MI, USA

[19] Molecular dynamics of the neutron star crust: freezing and chemical separation

Talk at: Astrophysical Transients: Multi-messenger Probes of Nuclear Physics 2011 (*Aug. 2011*) Seattle - WA, USA

[20] Phase transitions in stars

Poster at: National Nuclear Physics Summer School 2011 (*June 2011*) Chapel Hill - NC, USA

[21] Molecular dynamics simulations of carbon-oxygen mixtures

Talk at: March Meeting of American Physical Society 2011 (*Mar. 2011*) Dallas - TX, USA











[22] Neutron skin thickness within a density dependent hadronic model

Poster at: 44th Karpacz Winter School of Theoretical Physic (*Feb. 2008*) Łądek Zdrój, Poland

[23] Transition current densities for nuclear quasielastic scattering

Poster at: XXVIII Reunião de Trabalho Sobre Física Nuclear no Brasil (*Sept. 2005*) Guarujá, Brazil 2005

references

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