

Emanuel Vicente Chimanski

Chimanski, E. V.; Emanuel V. Chimanski; E. V. Chimanski

Ph.D. Student

Education

- 2018 **Ph.D. visiting student at Florida State University (FSU – Tallahassee/Florida– US) in the Physics Department**, Supervisor: Dr. Alexander Volya.
(Sep-Dec)
- 2017–2018 **Ph.D. internship at International Atomic Energy Agency (IAEA – Viena/Austria) in the Nuclear Data Development Unit**, Supervisor: Dr. Roberto Capote Noy.
- 2015–present **Ph.D. in progress in Science (Physics)**, *Aeronautics Institute of Technology – ITA*, Preliminary Thesis: Extension of the Quantum formalism of MSD Reactions, Advisor: Prof. Dr. Brett V. Carlson.
- 2013–2015 **Master in Science (Physics)**, *Aeronautics Institute of Technology – ITA*, Thesis: Route to hyperchaos in Rayleigh-Bénard convection, Advisor: Prof. Dr. Erico L. Rempel, Co-advisor: Dr. Roman Chertovskih.
- 2009–2013 **Licentiate degree in Physics**, *Universidade Estadual do Centro Oeste – UNICENTRO*, Thesis: Estatística de níveis em bilhares quânticos, Advisor: Prof. Dr. Eduardo Vicentini.

Complementary Education

- 2009–2015 **English Course**, *Wizard Brasil*.

Masters Thesis

- Title *Route to hyperchaos in Rayleigh-Bénard convection*
Advisor Prof. Dr. Erico L. Rempel
Co-advisor Dr. Roman Chertovskih

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Description The route to hyperchaos is studied by direct numerical simulation of Rayleigh-Bénard convection in the Boussinesq approximation. In the range of parameter considered, 9 convective attractors were found. The three largest Lyapunov exponents were computed in order to characterize all the attractors. For this, two different numerical methods were employed, one considering hypervolumes deformation (standard method) and the other the linearized system of equations (linearization method). Both numerical methods used to compute Lyapunov exponents produce similar results. This work, was the first study of transition from periodicity to hyperchaos in three-dimensional Rayleigh-Bénard convection, an important step in understanding the onset of turbulence.

Languages

Portuguese native

English writing: good, reading: good, speaking: good

Computer skills

Operational system.

- o GNU/Linux.

Programming.

- o FORTRAN90, GNU Octave, Python, L^AT_EX.

Research and work experience

- 2018 **Visiting Student at the Florida State University (FSU) (Physics Dep.), Tallahassee/Florida – US**, *Collective states and Random Matrix*.
- 2017– 2018 **Intern at the International Atomic Energy Agency – IAEA (Nuclear Data Development Unit), Vienna/Austria**, *Nuclear Reaction Models, Pre-Equilibrium Reactions*.
- 2013–present **Aeronautics Institute of Technology – ITA, SP/Brazil**, *Classical/Quantum Chaos, Mathematical Modelling, Nuclear Physics, Nuclear Reactions*.
- 2011–2013 **Universidade Estadual do Centro Oeste – UNICENTRO, PR/Brazil**, *Quantum chaos and quantum billiards*.

Teaching experience

- 2015 **FIS-14 Physics (mechanics) laboratory**, *Assistant teacher under supervision of Prof. Dr. José Silvério Edmundo Germano, Aeronautics Institute of Technology – ITA*.

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2012 **Fundamental Physics I**, Assistant teacher under supervision of Prof. Dr. Ricardo Yoshimitsu Miyahara, Universidade Estadual do Centro Oeste – UNICENTRO.

Publications

In preparation.

- L. A. Souza, E. V. Chimanski, T. Frederico, B. V. Carlson, M. S. Hussein. Four-body eikonal approach to three-body halo nuclei scattering. (<https://uk.arxiv.org/abs/1806.06278v1>)
- E. V. Chimanski, B. V. Carlson, R. Capote, A J Koning. Extension to the Multi-Step Direct Model.
- Manuel Schottdorf, Emanuel V. Chimanski and Ulf Dieckmann. Universality in evolution.

Published.

- E. V. Chimanski, B. V. Carlson, R. Capote, A J Koning. Quasiparticle nature of excited states in random-phase approximation. *Phys. Rev. C* **99** 014305 (2019). (<https://doi.org/10.1103/PhysRevC.99.014305>)
- Hussein, Mahi S. ; Souza, Lucas A. ; Chimanski, Emanuel ; Carlson, Brett; Frederico, Tobias. Inclusive Breakup Theory of Three-Body Halos. *EPJ Web of Conferences* (2017). (<https://doi.org/10.1051/epjconf/201716300024>)
- R. Chertovskih, E. L. Rempel and E. V. Chimanski. Magnetic field generation by intermittent convection, *PLA* (2017).
- R. Chertovskih, E. V. Chimanski and E. L. Rempel. Route to hyperchaos in Rayleigh-Bénard convection, *EPL*, **112** (2015) 14001.
- Emanuel V. Chimanski, Erico L. Rempel, Roman Chertovskih. On-off intermittency and spatiotemporal chaos in three-dimensional Rayleigh-Bénard convection, *Advances in Space Research*, **57** (2016), 1440-1447.

Books and Chapters.

- Chimanski, E. V., Martins, C. G. L., Chertovskih, R., Rempel, E. L., Roberto, M., Caldas, I. L., Chian, A. C.-L. Intermittency and transport barriers in fluids and plasmas, In: From nonlinear dynamics to complex systems: A Mathematical modeling approach, Springer, Elbert E. N. Macau (Ed.), Springer. (https://doi.org/10.1007/978-3-319-78512-7_5)

Others

Scientific Societies.

- Brazilian Society of Physics

Schools.

- School on Effective Field Theory across Length Scales at South American Institute for Fundamental Research, ICTP-SAIFR, Brasil – 2016. (60h)
- School on Physics Applications in Biology at South American Institute for Fundamental Research, ICTP-SAIFR, Brasil – 2016. (105h)
- Topycs in Computational Cosmology at Instituto Nacional de Pesquisas Espaciais, INPE, Brasil – 2014. (6h)

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Seminars.

- CEA, DAM, DIF, Bruyères-le-Châtel, France, June-2018
- Lawrence Livermore National Laboratory – LLNL - Livermore/California – US, September-2018.
- Department of Physics, Florida State University – FSU - Tallahassee/Florida – US , November-2018.
- Department of Physics and Astronomy Texas A&M University - Commerce/Texas – US, November-2018

Conferences, meetings and workshops. Talk * and poster † contribution.

- 6th International Workshop on Compound-Nuclear Reactions and Related Topics (CNR*18), 2018.
 - Multi-step direct reaction models including collectivity in nucleon induced reactions*.
- 15th International Conference on Nuclear Reaction Mechanisms, 2018.
 - Statistical multi-step direct reaction models and the RPA*.
- XL Brazilian Meeting on Nuclear Physics, 2017.
 - One- and two-step direct cross sections for nucleon-induced reactions*.
 - Reactions and structure of three-fragment weakly bound nuclei†.
- Physics meeting, 2016.
 - Quasi-Particle – Quasi-Hole Nature of High Energy RPA Modes†.
- 6th International Conference on Nonlinear Science and Complexity, 2016.
 - Route to hyperchaos and Intermittency in Rayleigh-Bénard convection*.
- National Meeting of Statistical Physics, 2015.
 - Leaking square quantum billiards†.
- Tenth Latin American Conference on Space Geophysics, 2014.
 - Route to hyperchaos in Rayleigh-Bénard convection†.
- Brazilian National Meeting on Condensed Matter Physics, 2012.
 - Influence of obtuse and acute angles in statistic of energy levels of quantum polygonals billiards†.
- Physics meeting, 2011.
 - Energy levels statistics in quantum obtuse triangular billiards†.

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