

Curriculum Vitae
Christine Córdula Dantas
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Address:

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Employment:

2004 – present: Instituto de Aeronáutica e Espaço, IAE-CTA, Brazil

Summary of Main Responsibilities:

To offer support to the activities at the Materials Division (AMR/IAE/CTA) through theoretical and numerical research in molecular physics, condensed matter physics and micromagnetism.

Other Research Interests:

Cosmology, quantum gravity, quantum computation, foundations of quantum mechanics, Mach's Principle.

Education:

2001: PhD in Astrophysics (Instituto Nacional de Pesquisas Espaciais, Brazil)
1996: MSc in Astrophysics (Instituto Nacional de Pesquisas Espaciais, Brazil)
1993: Bachelor in Astronomy (Universidade Federal do Rio de Janeiro, Brazil)
1991: Undergraduate Diploma in Data Processing Technology (Pontifícia Universidade Católica do Rio de Janeiro, Brazil)

Research/Professional Experience:

2007 - current: Researcher in Physics (Materials Division, IAE/CTA, Brazil)
2004 - 2007: Software Engineer (Electronics Division, IAE/CTA, Brazil)
2002 - 2004: Postdoctoral Researcher in Astrophysics (Instituto Nacional de Pesquisas Espaciais, Brazil)
2001 - 2002: Postdoctoral Researcher in Astrophysics (Universidade de São Paulo, Brazil)

Prizes and Grants:

2002 – 2004: FAPESP postdoctoral research grant
2001 – 2002: FAPESP postdoctoral research grant
2001: FAPESP travel expenses – M-Theory Cosmology conference in Cambridge, England
1996 – 2001: FAPESP graduate research grant
1994 – 1996: CAPES graduate research grant
1992 – 1993: CNPq undergraduate research grant

Societies:

Member of the Brazilian Astronomical Society (SAB)
Member of the International Astronomical Union (IAU)

Languages: Portuguese (native); English (fluent); Spanish (basics); Italian (basics); French (basics).

Published Papers in Refereed Journals:

1. DANTAS, C. C., ANDRADE, L. A. *Micromagnetic Simulations of Small Arrays of Submicron Ferromagnetic Particles*, **Physical Review B**, accepted for publication, 2008.
2. DANTAS, C. C., RAMOS, F. M. *Energy Ranking Preservation in a Cosmological Simulation*, **Monthly Notices of the Royal Astronomical Society**, v.370, p.420 - , 2006.
3. DANTAS, C. C., RAMOS, F. M. *Gravitational Mesoscopic Constraints in Cosmological Dark Matter Halos*, **Celestial Mechanics & Dynamical Astronomy**, v.94, p.67 - 81, 2006.
4. DANTAS, C. C. *A Note on the Integral Formulation of Einstein's Equations Induced on a Braneworld*, **General Relativity and Gravitation Journal** (Letters to the Editor), v.37, p.959 - , 2005.
5. DANTAS, C. C., CAPELATO, H. V., RIBEIRO, A. L. B., CARVALHO, R. R. *Fundamental Plane-Like Relations from Collisionless Stellar Dynamics: A Comparison of Mergers and Collapses*, **Monthly Notices of Royal Astronomical Society**, v.340, p.398 - , 2003.
6. DANTAS, C. C., CAPELATO, H. V., CARVALHO, R. R., RIBEIRO, A. L. B. *Dissipationless Collapse of Spherical Protogalaxies and the Fundamental Plane*, **Astronomy and Astrophysics**, v.384, p.772 - , 2002.
7. DANTAS, C. C., RIBEIRO, A. L. B., CAPELATO, H. V., CARVALHO, R. R. *The Two-Component Virial Theorem and the Physical Properties of Stellar Systems*, **Astrophysical Journal Letters**, v.528, p.L5 - L8, 2000.
8. DANTAS, C. C., CARVALHO, R. R., CAPELATO, H. V., MAZURE, A. *Evidence of Substructures in the Cluster of Galaxies A3558*, **Astrophysical Journal**, v.485, p.447 - , 1997.

Abstract Proceedings and Papers in Conferences:

1. ALVES, M. B. ; DANTAS, C. C. . *A topological formal treatment for scenario-based software specification of embedded real-time systems*. In: **20th ICSSEA International Conference**, 2007, Paris. 20th ICSSEA International Conference Proceedings, 2007.
2. DANTAS, C. C., RAMOS, F. M., CARVALHO, R. R., RIBEIRO, A. L. B., CAPELATO, H. V., *Scaling and Energy Rank Invariance in a Large Scale Lambda-CDM N-body Cosmological Simulation*, In: **Europhysics Conference on Computational Physics**, 2004, Genova. Europhysics Conference Abstracts. Genova: Istituto Nazionale per la Fisica della Materia, 2004. v.28D. p.226 - 227
3. DANTAS, C. C., CAPELATO, H. V., LIMA NETO, G. B., CARVALHO, R. R., *Dissipationless Mergers of Galaxies with Supermassive Blackholes and the Fundamental Plane*, In: **Reunião Anual da Sociedade Astronômica Brasileira**, 2003, São Pedro. Boletim da SAB. , 2003. v.23. p.148 -
4. RIBEIRO, A. L. B., DANTAS, C. C., CAPELATO, H. V., CARVALHO, R. R., *Relações de Escala de Objetos Astrofísicos no Contexto do Teorema do Virial com Duas Componentes*, In: **XXI Encontro de Físicos do Norte e Nordeste**, 2003, Pici - Cear.
5. RIBEIRO, A. L. B., DANTAS, C. C., CAPELATO, H. V., CARVALHO, R. R., *The Case Against Scale-Invariant Central Halo Densities: Implications for the Self-Interacting Dark Matter Scenarios in the Context of the Two-Component Virial Theorem*, In: **Reunião Anual da Sociedade Astronômica Brasileira**, 2003, São Pedro. Boletim da SAB. , 2003. v.23. p.163 -
6. DANTAS, C. C., CAPELATO, H. V., CARVALHO, R. R., *FP-Like Relations from Collisionless Stellar Dynamics*, In: **Reunião Anual da Sociedade Astronômica Brasileira**, 2002, Florianópolis. Boletim da SAB. , 2002. v.22. p.119 -
7. DANTAS, C. C., LIMA NETO, G. B., CAPELATO, H. V., *Numerical Simulations of Galaxies with a Central Massive Black Hole*, In: **Reunião Anual da Sociedade Astronômica Brasileira**, 2002, Florianópolis. Boletim da SAB. , 2002. v.22. p.120 -
8. RIBEIRO, A. L. B., CAPELATO, H. V., DANTAS, C. C., CARVALHO, R. R., *The Origin of Scaling Relations in Galaxies and Clusters of Galaxies*, In: **Institut d'Astrophysique de Paris (IAP) Meeting**, 2000, Paris. Constructing the Universe with Clusters of Galaxies. , 2000.
9. DANTAS, C. C., CAPELATO, H. V., CARVALHO, R. R., *Dissipationless Collapse and the Fundamental Plane*, In: **Reunião Anual da Sociedade Astronômica Brasileira**, 1997, Campos do Jordão. Boletim da SAB. , 1997. v.17. p.44 -
10. DANTAS, C. C., CAPELATO, H. V., *Do Dissipationless Collapses Also Reproduce de Fundamental Plane of Elliptical Galaxies?* In: **Science with Gemini: a South American Perspective**. Florianópolis: Universidade Federal de Santa Catarina, 1997. p.248 - 251
11. RIBEIRO, A. L. B., CARVALHO, R. R., ZEPF, S., DANTAS, C. C. *Estudo da Vizinhança de Grupos Compactos de Galáxias* In: **Reunião Anual da Sociedade Astronômica Brasileira**. Boletim da SAB. , 1995. v.15. p.13 -

12. DANTAS, C. C., CARVALHO, R. R., *Study of the Abell Cluster A3558*, In: **Reunião Anual da Sociedade Astronômica Brasileira**, 1994, Caxambu. Boletim da SAB. , 1994. v.14. p.82 -
13. DANTAS, C. C., CARVALHO, R. R., CAPELATO, H. V., *Dynamical and Structural Properties of A3558*, In: **XXIXth Rencontre de Moriond**, 1994, Moriond. Editions Frontieres, 1994. p.385 - 386

Participation in Scientific Meetings, Workshops, Advanced Schools, etc:

1. Dantas et al., *Simulações Numéricas de “Spin Waves” em Nanopartículas Ferromagnéticas*, in 3o. Workshop de Nanotecnologia Aeroespacial, São José dos Campos, Brazil, 2007.
2. BRAVO (Brazilian Virtual Observatory) Lectures, INPE, 2007.
3. Advanced Course I - A Roadmap for Cosmology, Dr. Robert R.Caldwell, Dr. Piero Madau, Dr. Scott Dodelson, INPE, 2005.
4. The Transient Milky Way: A Perspective For MIRAX, Workshop, INPE, 2005.
5. Workshop in Computational Cosmology, INPE, 2005.
6. PLAVIS - Plataforma para Validação e Integração de Software em Sistemas Espaciais, INPE, 2005.
7. Nova Física no Espaço, 2004.
8. II Seminário de Tecnologia da Informação, CTA, 2004.
9. II Escola Brasileira de Ciências Emergentes e III Encontro Regional de Matemática Aplicada e Computacional, INPE, 2002.
10. M-Theory Cosmology , Cambridge, Inglaterra, 2001.
11. Encontro Anual da SAB, 1997.
12. First Observational Cosmology School (ComObs School I), UFRJ, 1997.
13. Seminários de Relatividade Geral e Numérica SASGREN97, INPE, 1997.
14. Encontro Anual da SAB, 1995.
15. Encontro Anual da SAB, 1994.
16. Primeiro Encontro do Observatório do Valongo, UFRJ, 1993.

Participation in Science Board Committees:

1. “Produtividade em Pesquisa” – referee (cosmology), Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), Brazil, 2004.

Invited Talks:

1. A Influência de Buracos Negros Supermassivos na Formação das Galáxias, Nova Física, 2004.
2. Departure from Gaussianity of the Cosmic Pairwise Velocity Distribution: Mesoscopic Energy Constraints, IAG/USP, 2004.
3. Departure from Gaussianity of the Cosmic Pairwise Velocity Distribution: Mesoscopic Energy Constraints, DAS/INPE, 2004.
4. Investigações Sobre as Relações de Escala das Galáxias Elípticas, IAG/USP, 2002.
5. Estudos Sobre as Relações de Escala das Galáxias Elípticas, DAS/INPE, 2001.
6. O que é a Teoria-M? DAS/INPE, 2001.
7. Questões Atuais em Cosmologia, DAS/INPE, 1995.
8. Estudo do Aglomerado de Abell A3558, Observatório Nacional, 1992.

Invited Book Reviews:

1. Many Worlds in One, by A. Vilenkin, 2006.
2. The Trouble with Physics, by L. Smolin, 2006.

Technical Certificates:

1. LabView Basics I and II, National Instruments, Brazil, 2006.
2. Real-time Software Testing – Mastering IBM Rational Test RealTime, Brazil, 2006.
3. Rational Unified Process, Brazil, 2006.
4. Gerenciamento de Configurações, e Controle de Versões, Brazil, 2006.

5. Gerenciamento de Mudanças, Brazil, 2006.
6. Formal methods in real-time systems - part I, Brazil, 2005.
7. Formal methods in real-time systems - part II, Brazil, 2005.
8. Object Oriented Programming in C++, Brazil, 2004.
9. HTML and Javascript Programming, CTA, Brazil, 2004.

Participation in Research and Technology Development Projects:

1. Participation in the project “Análise de Modelos de Requisitos de Software e Métodos Topológicos Formais” (TopReq, IAE/CTA), of the “Tecnologias Associadas” Program of the Brazilian Space Agency (AEB; 2007, present).
2. Member of the group responsible for the embedded software (“Software Aplicativo de Bordo” – SOAB) of the launching rocket VLS (“Veículo Lançador de Satélites”), IAE/CTA (2004 - 2007).
3. Participation in the project “Ambiente para Testes de Software Crítico” (LSITES IAE/CTA), of the “Tecnologias Associadas” Program of the Brazilian Space Agency (AEB; 2005 - 2007).
4. Participation in the project “Interface para Girômetro a Fibra Óptica” (IAE/CTA; 2005 - 2006).
5. “Computational Cosmology” project with collaboration of Dr. Fernando M. Ramos (LAC/INPE; 2004 - 2006).
6. Cosmology project (“Projeto Temático” – FAPESP-2000/06770-2): N-body gravitational simulations of galactic models with supermassive central black holes (2002 - 2004).

Students under supervision:

1. Cristiane Camilo Hernandez (PhD candidate in Applied Computer Science, INPE, beginning March 2007). Thesis: *Initial Conditions in Cosmology: an Evolutionary Algorithm’s Approach*.

Outreach Activities:

1. Created and presented a movie about the Universe and the Solar System to 8-year old students, Escola Moppe, São José dos Campos, Brazil, 2007.