

Curriculum Vitae

Personal details

Full name: Torsten Bringmann
Date and place of birth: 7 Sep 1974 in Bonn, Germany
Address: II. Institut für Theoretische Physik
Universität Hamburg
Luruper Chausse 149
D-22761 Hamburg, Germany
email: torsten.bringmann@desy.de
homepage: <http://www.desy.de/~t troms/>

Research

My main area of research so far has been on the interface between cosmology, (astro-) particle physics and physics beyond the Standard Model, with a focus on dark matter in the context of supersymmetric models and models with large extra dimensions. Further research interests include cosmic rays, primordial black holes and general relativity.

Academic history

Since Oct 2009 Emmy Noether fellow and leader of a junior research group (*From Dark Matter Properties to the Fundamental Theory*) at the University of Hamburg
Oct 2007 – Oct 2009 Affiliated researcher at the High Energy Astrophysics and Cosmology Centre of Excellence (HEAC) in Stockholm
Oct 2005 - Oct 2007 Postdoctoral Fellow and INFN associate at SISSA/ISAS, Trieste, Italy

Education

Aug 2002 - Sep 2005 PhD in theoretical physics at the university of Stockholm, Sweden
Thesis *Cosmological aspects of Universal Extra Dimensions*
Supervisor: Lars Bergström
Dec 2001 Diploma in physics
Thesis *Primordial black holes in the inflationary universe*
Supervisor: Claus Kiefer
Oct 1998 - Nov 2001 Student at the university of Freiburg, Germany
Sep 1997 - Aug 1998 Exchange student at the university of Tromsø, Norway
Sep 1997 Intermediate examination (Vordiplom) in physics
Oct 1995 - Sep 1997 Undergraduate studies at the university of Konstanz, Germany
Subjects: Physics (Diplom) and philosophy (M.A.)

Professional activities

June 2011	International workshop on Indirect Dark Matter Searches (organizer), DESY
since Oct 2010	weekly AstroChat (organizer), Hamburg
Dec 2009	Mini-Symposium on Dark Matter Physics (organizer), Hamburg
since Nov 2009	participant/member in the collaborative research project (SFB) <i>Particles, strings and the early universe: the structure of matter and spacetime</i>
Aug 2008	Conference Identification of Dark Matter (convener), Stockholm
Jul 2008	Graduate summer school on “De SitterCosmology” (organizer), NORDITA/Stockholm
since 2005	participant/member of the European Network of Theoretical AstroParticle Physics (ENTApP / ILIAS)

Teaching

Apr 2011 - July 2011	Lecture on <i>Dark Matter</i> for graduate students
Oct 2010 - Feb 2011	Student seminar on <i>Theoretical Astroparticle Physics</i>
2010	Substitute teacher for undergraduate classes in <i>Quantum Mechanics</i> and <i>Thermodynamics/Statistical Physics</i>
2000–2004	Tutor for undergraduate university courses in <i>mathematics, mechanics</i> and <i>relativistic quantum mechanics</i> .

Other relevant experience

Referee activity:	PRL, PRD, JCAP, JHEP
Computer skills:	Working experience w/ Mac, Linux/Unix and Windows systems; mathematica; FORTRAN, c/c ⁺⁺ , Java, Turbo Pascal (co-author of the DarkSUSY package)
Languages:	German (native), English, Swedish (fluent), Italian (very good), Norwegian (good), French, Japanese, Mandarin (basic knowledge)

List of Publications

Refereed publications

- [1] L. Bergström, T. Bringmann and J. Edsjö, “Complementarity of direct dark matter detection and indirect detection through gamma rays”, accepted for publication in *Phys. Rev. D* (2010) [arXiv:1011.4514 [hep-ph]].
- [2] T. Bringmann, “Particle Models and the Small-Scale Structure of Dark Matter”, *New J. Phys.* **11**, 105027 (2009) [arXiv:0903.0189 [astro-ph.CO]].
- [3] T. Bringmann, Julien Laval and Pierre Salati, “Intermediate Mass Black Holes and Nearby Dark Matter Point Sources: A Critical Reassessment”, *Phys. Rev. Lett.* **103**, 161301 (2009) [arXiv:0902.3665 [astro-ph.CO]].
- [4] L. Bergström, G. Bertone, T. Bringmann, J. Edsjö and M. Taoso, “Gamma-ray and Radio Constraints of High Positron Rate Dark Matter Models Annihilating into New Light Particles”, *Phys. Rev. D* **79**, 081303 (2009) [arXiv:0812.3895 [astro-ph]].
- [5] T. Bringmann, M. Doro and M. Fornasa, “Dark matter signals from Draco and Willman 1: Prospects for MAGIC II and CTA”, *JCAP*, **0901**, 016 (2009) [arXiv:0809.2269 [astro-ph]].
- [6] L. Bergström, T. Bringmann and J. Edsjö, “New Positron spectral features from Supersymmetric Dark Matter Annihilation – a Way to Explain the PAMELA Data?”, *Phys. Rev. D* **77**, 103520 (2008) [arXiv:0808.3725 [astro-ph]].
- [7] E. A. Baltz *et al.*, “Pre-launch estimates for GLAST sensitivity to Dark Matter annihilation signals”, *JCAP* **0807**, 013 (2008) [arXiv:0806.2911 [astro-ph]].
- [8] T. Bringmann, L. Bergström and J. Edsjö, “New Gamma-Ray Contributions to Supersymmetric Dark Matter Annihilation”, *JHEP* **0801**, 049 (2008) [arXiv:0710.3169 [hep-ph]].
- [9] F. Borzumati, T. Bringmann and P. Ullio, “Dark matter from late decays and the small-scale structure problems”, *Phys. Rev. D* **77**, 063514 (2008) [arXiv:hep-ph/0701007].
- [10] T. Bringmann and S. Hofmann, “Thermal decoupling of WIMPs from first principles”, *JCAP* **0407**, 016 (2007) [arXiv:hep-ph/0612238].
- [11] T. Bringmann and P. Salati, “The galactic antiproton spectrum at high energies: background expectation vs. exotic contributions”, *Phys. Rev. D* **75**, 083006 (2007) [arXiv:astro-ph/0612514].
- [12] L. Bergström, T. Bringmann, M. Eriksson and M. Gustafsson, “Gamma rays from heavy neutralino dark matter”, *Phys. Rev. Lett.* **95**, 241301 (2005) [arXiv:hep-ph/0507229].
- [13] T. Bringmann, “High-energetic cosmic antiprotons from Kaluza-Klein dark matter”, *JCAP* **0508**, 006 (2005) [arXiv:astro-ph/0506219].
- [14] L. Bergström, T. Bringmann, M. Eriksson and M. Gustafsson, “Two photon annihilation of Kaluza-Klein dark matter”, *JCAP* **0504**, 004 (2005) [arXiv:hep-ph/0412001].
- [15] L. Bergström, T. Bringmann, M. Eriksson and M. Gustafsson, “Gamma rays from Kaluza-Klein dark matter”, *Phys. Rev. Lett.* **94**, 131301 (2005) [arXiv:astro-ph/0410359].

- [16] T. Bringmann and M. Eriksson, “Can homogeneous extra dimensions be stabilized during matter domination?”, JCAP **0310**, 006 (2003) [arXiv:astro-ph/0308498].
- [17] T. Bringmann, M. Eriksson and M. Gustafsson, “Cosmological evolution of homogeneous universal extra dimensions”, Phys. Rev. D **68**, 063516 (2003) [arXiv:astro-ph/0303497].
- [18] D. Blais, T. Bringmann, C. Kiefer and D. Polarski, “Accurate results for primordial black holes from spectra with a distinguished scale”, Phys. Rev. D **67**, 024024 (2003) [arXiv:astro-ph/0206262].
- [19] T. Bringmann, C. Kiefer and D. Polarski, “Primordial black holes from inflationary models with and without broken scale invariance”, Phys. Rev. D **65**, 024008 (2002) [arXiv:astro-ph/0109404].

Numerical packages

- [20] P. Gondolo, J. Edsjö, L. Bergström, P. Ullio, M. Schelke, E. A. Baltz, T. Bringmann and G. Duda, *DarkSUSY 5.0: Computing supersymmetric dark matter properties numerically*, publicly available at <http://www.physto.se/~edsjo/darksusy>.

Conference proceedings

- [21] T. Bringmann, “Thermal decoupling of WIMPs: A link between particle physics properties and the small-scale structure of (dark) matter”, to appear in the proceedings of the conference “Cosmic Radiation Fields – Sources in the early universe”, Hamburg, 10-12 Nov 2010.
- [22] T. Bringmann, “Gamma rays from dark matter”, to appear in the proceedings of the ICATPP conference on cosmic rays for particle and astroparticle physics, Como, Italy, 7-8 Oct 2010.
- [23] T. Bringmann, “Dark Matter Annihilation Signals – the importance of radiative corrections”, Proc. of Science (idm2008), 026 (2008) [arXiv:0810.5304 [hep-ph]].
- [24] T. Bringmann, “Searching for point-like dark matter sources”, in: A. Lionetto and A. Morselli (Eds.), *Science with the new generation high energy gamma-ray experiments*, Frascati Physics Series 45 (2007) [arXiv:0712.1548 [astro-ph]], pp. 79–86.
- [25] A. Morselli, G. Bertone, G. Busetto, R. Rando and T. Bringmann, “GLAST Sensitivity to Point Sources of Dark Matter Annihilation”, AIP Conf. Proc. **921**, 506 (2007).
- [26] L. Bergström, T. Bringmann, M. Eriksson and M. Gustafsson, “Gamma-ray signatures for Kaluza-Klein dark matter”, AIP Conf. Proc. **861**, 814 (2006) [arXiv:astro-ph/0609510].
- [27] T. Bringmann, M. Eriksson and M. Gustafsson, “Stability of Homogeneous Extra Dimensions”, AIP Conf. Proc. **736**, 141 (2005) [arXiv:astro-ph/0410613].

Theses

- [28] T. Bringmann, *Cosmological aspects of Universal Extra Dimensions*, PhD thesis, ISBN 91-7155-117-4, Stockholm (2005).
- [29] T. Bringmann, *Stability of homogeneous extra dimensions*, Licentiate thesis, Stockholm (2003).
- [30] T. Bringmann, *Primordiale schwarze Löcher im inflationären Universum*, (Primordial black holes in the inflationary universe, in German), Diploma thesis, Freiburg (2001).

Invited and Plenary Talks (apart from local seminars etc.)

- [31] *Thermal decoupling of WIMPS: A link between particle physics properties and the small-scale structure of (dark) matter*,
plenary talk at the Cosmic radiation fields conference (CRF2010), Hamburg, Germany, 10-12 Nov 2010.
- [32] *Gamma rays from Dark Matter*,
invited plenary talk at the ICATPP conference on Cosmic Rays for Particle and Astroparticle Physics, Como, Italy, 7-8 Oct 2010.
- [33] *Indirect Dark Matter Searches*,
invited plenary talk at the TeV Particle Astrophysics conference (TeVPA 2010), Paris, France, 19-23 Jul 2010.
- [34] *Thermal decoupling of WIMPs: A link between particle physics properties and the small-scale structure of (dark) matter*,
plenary talk at the PPC 2010 international workshop on the interconnection between particle physics and cosmology, Turin, Italy, 12-15 Jul 2010.
- [35] *Cosmic Rays – A key to dark matter searches?*,
invited plenary talk at the yearly meeting of the German Physical Society (74. Jahrestagung der DPG), Bonn, Germany, 15-19 Mar 2010.
- [36] *Indirect DM Searches: Radiative corrections and the need for clear spectral signatures*,
invited talk at the group seminars of the Institut d'Astrophysique de Paris, 28 Oct 2008, and the DESY theory group, Hamburg, 10 Nov 2008.
- [37] *Dark Matter Annihilation Signals – the importance of radiative corrections*,
plenary talk at the indirect detection of dark matter conference (idm2008), Stockholm, Sweden, 18-22 Aug 2008.
- [38] *Dark matter annihilation signal in gamma rays – the importance of radiative corrections*,
invited talk at the “particle and astroparticle physics seminar”, university of Zurich, Switzerland, 9 Apr 2008 and the “Theory seminar”, Max Planck Institut für Physik, Munich, Germany, 7 Apr 2008.
- [39] *New Gamma-Ray Contributions to Supersymmetric Dark Matter Annihilation*,
plenary talk at the “4th annual ILIAS/N6-ENTApP meeting”, DESY, Hamburg, Germany, 3-5 Mar 2008.

- [40] *Gamma-ray spectra from dark matter annihilations*,
invited talk at “TeV Particle Astrophysics 2007”, Venice, Italy, 27 - 31 Aug 2007.
- [41] *Searching for point-like dark matter sources*,
invited plenary talk at the “5th workshop on High Energy Gamma-ray Experiments”
(SciNeGHE07), Frascati, Rome, 18 - 20 Jun 2007.
- [42] *Dark Matter from Late Decays and the small-scale structure problems*,
invited talk at the theory group seminar, Bielefeld, Germany, 5 Jun 2007.
- [43] *Kaluza-Klein Dark Matter*,
invited review talk at the “ENTApP Visitor Programme and Workshop on Dark Matter”,
SISSA, Trieste, Italy, 12 - 21 Oct 2005.
- [44] *Stability of homogeneous extra dimensions*,
invited talk at the “Gravity seminar”, Cologne, Germany, 5 Jul 2004.