

MIGUEL ANGEL ARAGON CALVO

Department of Physics and Astronomy
Johns Hopkins University
3701 San Martin Drive
Baltimore, MD 21218
(410) 516 3285
miguel@pha.jhu.edu

EDUCATION

University of Groningen Ph.D., Astrophysics Thesis entitled: " <i>Morphology and Dynamics of the Cosmic Web</i> " Advisors: <i>Prof. Rien van de Weygaert, Prof. Thijs van der Hulst</i>	The Netherlands 2007
Instituto Nacional de Astrofísica, Óptica y Electrónica Masters in Astrophysics Thesis entitled: " <i>Simulations of the Sunyaev-Zel'dovich effect and their application to future millimeter-wavelength experiments.</i> " Advisors: <i>David Hughes, Enrique Gaztañaga</i>	Puebla, México 2002
Instituto Tecnológico de Cd. Guzmán Electronics Engineering	Jalisco, México 2000

WORK EXPERIENCE

Johns Hopkins University <i>Postdoc position financed by the Moore Foundation.</i> Development of analysis tools for the characterization of the distribution of matter delineated by galaxies. This is accomplished by means of novel geometric algorithms (Voronoy and Delaunay tessellations, Natural Neighbor Interpolation, Scale-space feature detection (medical imaging), Watershed using both regular grid and Delaunay triangulation). Study of properties of galaxies as a function of their cosmological environment (Clusters, filaments, walls and voids). The observed distribution and properties of galaxies is compared to theoretical and numerical models. These models are computed using state-of-the-art gravitational codes running in large computer clusters. Other areas of research: Development of data intensive data mining and visualization techniques. Development of advanced visualization techniques of both physical and non-physical quantities. Feature detection and classification in phase-space and identification of patterns in time and space of environmental data.	Baltimore, USA 2007-
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University of Groningen The Netherlands
Teaching assistant *Introduction to Cosmology* 2004
Exercises solving and tutoring.

University of Groningen The Netherlands
Teaching assistant *Statistics 1* 2003
Exercises solving and tutoring.

Centro de Tecnología de Semiconductores Gdl. Jalisco, México
Becary 2000
Development of software tools for ATMEL microcontrollers. Development of testing software for a proprietary network. Installation of a cat-5 network and writing of user's manual.

Instituto Tecnológico de Ciudad Guzmán Gdl. Jalisco, México
Mathematics 0 and Chemistry 0 courses 1998
Introductory courses for students.

PUBLICATIONS

The Multiscale Morphology Filter: Identifying and Extracting Spatial Patterns in the Galaxy Distribution

Astronomy and Astrophysics, Volume 474, Issue 1, October IV 2007, pp. 315-338

Spin Alignment of Dark Matter Halos in Filaments and Walls

The Astrophysical Journal, Volume 655, Issue 1, January 2007, pp. L5-L8

The Multiscale Morphology Filter

Proceedings of Bernard's Cosmic Stories: from primordial fluctuations to the birth of stars and galaxies. June 26-30, 2006. UIMP, Valencia, Spain.

Confronting Scenarios for Galaxy Spin Acquisition

Proceedings of Bernard's Cosmic Stories: from primordial fluctuations to the birth of stars and galaxies. June 26-30, 2006. UIMP, Valencia, Spain.

CONGRESSES AND WORKSHOPS

Sloan Digital Sky Survey (collaboration meeting at Fermilab) Chicago, USA
Invited speaker, with talk: *Multiscale Morphology Filter applied to the distribution of galaxies.* 2007

Much ado about nothing: Cosmic Voids (Congress) The Netherlands
Invited speaker, with talk: *The Multiscale Morphology Filter.* 2006

The World a Jigsaw (Congress/workshop) <i>Invited speaker, with talk: The Multiscale Morphology Filter.</i>	The Netherlands 2006
Cosmic Voids, Aspen Center for Physics (Workshop) <i>Invited participant.</i>	Aspen, USA 2006
Parallel programming (Extracurricular course) <i>Participant.</i>	The Netherlands 2005
Outskirt of Galaxy Clusters (Congress) <i>Participant.</i>	Torino, Italy 2004
Frontiers of the Universe (Summer school) <i>Participant.</i>	Corsica, France 2003
Molecular Astrophysics (Extracurricular course) <i>Participant.</i>	Puebla, México 2001
New Quest in Stellar Astrophysics (Congress) <i>Participant.</i>	Jalisco, México 2001

AWARDS

Moore fellow. <i>Johns Hopkins University.</i>	<i>Baltimore, USA</i> 2007-
Certificate of first in class, masters program in astrophysics. <i>Instituto Nacional de Astrofísica, Óptica y Electrónica.</i>	<i>Puebla, México</i> 2001
Second highest score in CENEVAL national exam. <i>Instituto Nacional de Astrofísica, Óptica y Electrónica.</i>	<i>Puebla, México</i> 2002
CONACYT becary. <i>Instituto Nacional de Astrofísica, Óptica y Electrónica.</i>	<i>Puebla, México</i> 2000-2002
First general place. Creativity contest, regional stage IV. <i>Instituto Tecnológico de Ciudad Guzmán</i>	<i>Jalisco, México</i> 2000
Second general place. Sciences contest, regional stage III. <i>Instituto Tecnológico de Ciudad Guzmán</i>	<i>Jalisco, México</i> 1999

OTHER SKILLS

Languages:

Spanish (100 %)

English (100 %)

Dutch (50 %)

Operative systems:

Linux

Windows

Solaris

Programming languages:

c/c++

IDL

Python

Processing (java dialect)

Matlab

Visual Basic

Assembler for ATMEL y MICROCHIP microcontrollers

Graphic design:

Blender 3D

Gimp

Inkscape

Xfig

Processing