

Curriculum Vitae

Dr. Victor H. Robles

Nationality: Mexican

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Research Interests

Dark matter, its evolution and its consequences on galaxy formation
Numerical simulations of galaxies in alternative dark matter models
Dwarf galaxies, small-scale problems of Λ CDM

Education

Bachelor's Degree in Physics and Mathematics from IPN, Mexico	2005-2009
Master's Degree in Physics from CINVESTAV IPN México D.F, Advisor Tonatiuh Matos Chassin Title "Problems and Alternatives to Λ CDM"	2009-2011
Ph. Degree in Physics from CINVESTAV México D.F. Advisor Tonatiuh Matos Chassin Title "Comparing the latest galaxy observations with current dark matter models"	2011-2015
Postdoctoral position in University of California, Irvine, CA, USA Collaboration: Prof. James S: Bullock	2015-2018

Experience

A) Teaching Experience

Teaching Practice of English at the Teacher Training Course at the Anglo part of The Anglo Mexican Foundation, A.C.	
Teaching Assistant, "Mathematical Methods I", CINVESTAV IPN	Aug.-Dec. 2010
Teaching Assistant, "Statistical Physics", CINVESTAV IPN	Aug.-Dec. 2014
Teaching Assistant, "Mathematical Methods", CINVESTAV IPN	Jan. -Mar. 2015

B) Research collaborations

Research visit at University of California, Irvine, USA Collaboration with Prof. James S. Bullock.	2014
Research visit at Astronomisches Rechen-Institut (ARI), Heidelberg, Germany. Collaboration with Dr. Veronica Lora	2015
Research visit at Caltech, Pasadena, USA Collaboration with Prof. Philip Hopkins	2015

Leadership and proposals

Reviewer for the following journals: Monthly Notices of the Royal Astronomical Society (MNRAS) Astronomy and Astrophysics (A&A) Research in Astronomy and Astrophysics (RAA) Astrophysical Journal (ApJ) Successfully applied to San Diego Supercomputer Center's High-Performance Computing@UC program (awarded 500,000 CPU)	2016
Organizer of postdoc social meetings (informal discussions)	2016-17

Awards

TELMEX Foundation scholarship for excellence (Bachelor's)	2006-2009
CONACYT scholarship for Master's Program	2009-2011
CONACYT scholarship for Ph.D. in Physics	2011-2015
CONACYT scholarship for short visits abroad	2014/2015
CONACYT international postdoctoral scholarship	2015-2016
UCMEXUS-Postdoctoral Fellowship	2016-2017
Prize Arturo Rosenblueth 2016 for best Ph.D thesis in Exact and Natural Sciences	2016

Computational skills

Numerical:	High performance N-body simulations in GADGET 2 and GIZMO Simulations with FIRE (Feedback In Realistic Environments) Member of the FIRE (Feedback In Realistic Environments) project
Programming:	Python, C, Mathematica
Software:	Latex, Yt (Visualization and data analysis software), Office suite, Photoshop, HTML, CSS, gnuplot
Languages:	Spanish (mother tongue), English (First Certificate in English), French (DELFB2), German (basic-A1)

Outreach and Press Releases

A) NASA/Chandra Press Release

Is Dark Matter Fuzzy?

Collaboration with Tula Bernal and Tonatiuh Matos

<http://chandra.harvard.edu/blog/node/642>

B) Visualization for a press release related to Kapteyn star

Collaboration with James Bullock and Miguel Rocha from UC Irvine and Joel Primack from University of California - Santa Cruz.

<http://ph.qmul.ac.uk/ancient-worlds-around-kapteyns-star>

UCI Astronomy Outreach Program

2017-

Public outreach and talks for students *Cinvesniños-CINVESTAV*

2014-15

List of Publications

Link to publications list: https://arxiv.org/find/astro-ph/1/au:+Robles_V/0/1/0/all/0/1

First Author papers:

- 1) “Scalar Field Dark Matter: Helping or Hurting Small-Scale Problems in Cosmology?”
Victor H. Robles, J. S. Bullock, M. Boylan-Kolchin, arXiv:1807.06018, 2018
- 2) “SIDM on FIRE: Hydrodynamical Self-Interacting Dark Matter simulations of low mass dwarf galaxies”
Victor H. Robles, J. S. Bullock, O. D. Elbert, A. Fitts, A. González-Samaniego, M. Boylan-Kolchin, P. F. Hopkins, C.-A. Faucher-Giguère, D. Kereš, C. C. Hayward, MNRAS, 472, Issue 3, 2945, 2017
- 2) “Evolution of a dwarf satellite galaxy embedded in a scalar field dark matter halo”
Victor H. Robles, V. Lora, T. Matos, F.J. Sanchez-Salcedo, 2014, arXiv:1404.3424, The Astrophysical Journal, 810, Issue 2, 2015, article id. 99, pp. 11
- 3) “SFDM: A new formation mechanism of tidal debris”
Victor H. Robles, L.A. Martinez-Medina, T. Matos, 2015, arXiv:1503.00799
- 4) “Finite Temperature Density Profile in SFDM”
Victor H. Robles, T. Matos, 2013. Published in *Sources and Detection of Dark Matter and Dark Energy in the Universe*, Ed. David Cline, Springer Proceedings in Physics, Vol. 148, Springer Netherlands, 2013, pp. 17-24.

- 5) “Strong Lensing with Finite Temperature Scalar Field Dark Matter”
Victor H. Robles, T. Matos, 2013, Phys.Rev. D88, 2013, 083008
- 6) “Exact Solution to Finite Temperature SFDM: Natural Cores without Feedback”,
Victor H. Robles, T. Matos, published in Astrophys. J., 763, 2013, 19
- 7) “Flat Central Density Profile and Constant DM Surface Density in Galaxies from Scalar Field Dark Matter”
Victor H. Robles and T. Matos, MNRAS, 422, 2012, 282-289

Co-author papers:

- 8) “Galaxy Formation with BECDM: I. Turbulence and relaxation of idealised haloes”,
P. Mocz, M. Vogelsberger, **Victor H. Robles**, J. Zavala, M. Boylan-Kolchin, A. Fialkov, and L. Hernquist, 2017, MNRAS 471, 4559–4570, 2017
- 9) “Mass discrepancy-acceleration relation: A universal maximum dark matter acceleration and implications for the ultralight scalar dark matter model”
L. Arturo Ureña-López, **Victor H. Robles**, and T. Matos, 2017, Phys. Rev. D 96, 2017, 043005
- 10) “Feedback first: the surprisingly weak effects of magnetic fields, viscosity, conduction, and metal diffusion on galaxy formation”
K.-Y. Su, P. F. Hopkins, C. C. Hayward, C.A. Faucher-Giguere, D. Keres, X. Ma, **Victor H. Robles**, 2017, MNRAS 471, 144–166
- 11) “Scalar Field Dark matter in Clusters of galaxies”
T. Bernal, **Victor H. Robles**, T.Matos, 2017, MNRAS 468, 3135–3149
- 12) “Scalar Field (Wave) Dark Matter”
T. Matos and **Victor H. Robles**, 2016,
[arXiv:1601.01350](https://arxiv.org/abs/1601.01350), Proceedings of the Fourteenth Marcel Grossman Meeting on General Relativity.
- 13) “Dwarf galaxies in multistate Scalar Field Dark matter haloes”
L. A. Martínez-Medina, **Victor H. Robles**, T. Matos, 2015, PRD 91, 023519
- 14) “A Review on the Scalar Field Bose-Einstein Condensate Dark Matter Model”
A. Suarez, **Victor H. Robles**, T. Matos, In: *Accelerated Cosmic Expansion*.
Ed. By Claudia Moreno González, José Edgar Madriz Aguilar, and Luis Marina Reyes Barrera. Astrophysics and Space Science Proceedings, Vol. 38, Springer International Publishing, 2014, pp. 107-142.
- 15) “A brief Review of the Scalar Field Dark Matter model”
Juan Magaña, T. Matos, **Victor H. Robles**, Abril Suárez, 2012, [arXiv:1201.6107](https://arxiv.org/abs/1201.6107)

Academic Presentations

A) Invited Talks and Seminars

- Astronomy Colloquium, UCSM, CA, USA, Scheduled Jan 24, 2018.
- Seminar talk at UCLA, Astronomy Department, CA, USA, Oct. 20, 2017.
- Talk at Stanford KiPAC seminar, CA, USA, Sep. 12, 2017. Talk: “Towards a deeper understanding of DM using FIRE astrophysics”
- Invited talk at the CfA Harvard-Smithsonian, Cambridge, USA, July 2016, Talk: “Setting self-Interacting dark matter on FIRE”.
- Invited talk at the CfA Harvard-Smithsonian, Cambridge, USA, March 2017, Talk: “Exploring the impact of self-interactions and ultra-light DM on the visible component at galactic scales”.
- Seminar talk in the astrophysics group at Princeton, New Jersey, USA, July 2016, “Setting self-Interacting dark matter on FIRE”.
- 66th Lindau Nobel Laureate Meeting, Lindau, Germany, June 26- July 1 2016. Invited participation.
- Invited talk in KIAS, Seoul, Korea, November 11, 2014. Title “Constraints on scalar field dark matter from cosmological observables”

B) Contributed Conference Presentations and Workshops

- 2017 Santa Cruz Galaxy Workshop, Santa Cruz, USA, August 7-11 2017, Talk: “Testing fuzzy and self-interacting DM models with simulations of dwarf galaxies”
- 13th Rencontres du Vietnam: Exploring the Dark Universe, Quy Nhon, Vietnam, July 23-29, 2017, Talk: “SIDM on FIRE: Self-Interacting Dark Matter simulations of dwarf galaxies with Feedback In Realistic Environments”
- 13th Asian-Pacific Regional IAU Meeting, Taipei, Taiwan, July 3-7, 2017, Talk: SIDM on FIRE: Self-Interacting Dark Matter simulations of dwarf galaxies with Feedback In Realistic Environments. Also Poster: “Observational consequences of ultra-light scalar field (Wave) dark matter”
- The 21st International Conference on General Relativity and Gravitation, New York, USA, July 10-15 2016. Talk: “Constraining the mysterious dark matter with recent cosmological and galactic observations”.
- European Week of Astronomy and Space Science Athens, Greece July 4-8 2016, Talks: 1) “Testing the cold dark matter model with cluster mass distribution” 2) “Using the strong lensing and the Einstein radius to infer dark matter distribution in the SFDM model”.
- The 32nd IAP Colloquium, Paris, France June 20-24 2016, Poster: “Impact of the UV background in SIDM/CDM dwarf galaxies”.
- Essential Cosmology for the Next Generation, Cancún, Mexico, January 10-16 2016.

- IAU XXIX General Assembly Honolulu, Hawaii, August 3-14 2015, Poster- "Observational consequences in galactic scales of the scalar field dark matter paradigm".
- The 6th KIAS workshop on cosmology and structure formation. Seoul, Korea, November 3-7 2014. Talk "Dwarf galaxy observations as a test to CDM and SIDM model's predictions"
- 11th Potsdam Thinkshop: Satellite galaxies and dwarfs in the local group, Potsdam, Germany, August 25-29, 2014, Poster "Supernova feedback in dwarf SIDM halos"
- Workshop on Cosmology from baryons at high redshift, Trieste, Italy, August 18-21 2014.
- Summer school on Cosmology, Trieste, Italy, August 4-15 2014
- 27th Texas Symposium on Relativistic Astrophysics, Dallas, USA, December 8-13, 2013, Talk: "Finite Temperature Scalar Field dark matter haloes".
- Seventh Aegean Summer School, Paros, Greece, September 23-28. Talk: "Dark matter halos in the scalar field DM model".
- SCALARS 2013, Warsaw, Poland, September 12-16 2013. Talk: "Rotation Curves from finite temperature scalar field dark matter".
- Encuentros Relativistas Españoles, Benasque, Spain. September 8-12 2013. Talk: "Properties of scalar field dark matter halos".
- International Conference on Particle Physics and Cosmology-COSMO 2013, Cambridge, UK September 2-6, 2013, Talk: "Finite Temperature Scalar Field haloes and strong gravitational lensing constrains".
- COSMO 12, Beijing, China, September 10-14 2012. Talk "Exact Solution to finite temperature SFDM: Natural cores without feedback".
- IAU XXVIII General Assembly session "Galaxy Evolution through secular processes", Beijing, China, August 20-24 2012, Poster "Galaxy rotation curves from finite temperature SFDM".
- Cosmology on the Beach 2012, Cancún, Mexico, January 16-20, 2012. Poster title: "Flat Central Density Profile and Constant DM Surface Density in Galaxies from Scalar Field Dark Matter".
- Symposium "Symmetries and Phases in the Universe", Kloster Irsee, Germany, February 27- March 1st 2012 poster "Phase transition of the Scalar Field Dark Matter model and its hydrodynamical evolution equation."
- 19th International Conference on General Relativity and Gravitation held from July 5-9, 2010 in Mexico City, Mexico.
- VIII WORKSHOP DGFM-SMF. Talk titled: "Is it really needed to modify the standard model of cosmology? Held from November 22-26, 2010, in Tuxtla Gutierrez Chiapas, Mexico

References

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