José-Alberto Vázquez | Brookhaven National Lab, U.S. Department of Energy

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Current Position

Brookhaven National Lab, U.S. Department of Energy. **NY, US**
Post-doctoral Research Associate, Prof. A. Slosar. *Oct.2013 -*
"Cosmological Implications of BAO measurements and Lyman-α forest analysis".
Member of the SDSS-III/SDSS-IV collaboration.

Research Interests

BAO, CMB, Ly-α forest; Dark Energy, Inflation; Data analysis.
Website, LinkedIn, GitHub.

Education and Work Experience

KICC, University of Cambridge. **Cambridge, UK**
Ph.D. in Astrophysics, Prof. A. Lasenby and Prof. M. Hobson. *2009-2013*
"Constraining alternative cosmological models with current and future observations".

DAMTP, University of Cambridge. **Cambridge, UK**
MASt. in Mathematics, Dr. A. Challinor. *2008-2009*
"Constraining cosmological Inflation".

Physics Department, CINVESTAV. **DF, MX**
M.Sc. in Physics, Prof. T. Matos. *2005-2007*
"Dynamical systems in Scalar Field Cosmologies".

Faculty of Sciences, UAEMor. **Morelos, MX**
B.Sc. in Physics, Prof. T. Matos. *2000-2005*
"Galaxy formation with scalar-field dark matter".

Research Internships

Physics Department, CINVESTAV. **DF, MX**
Visiting Researcher, hosted by Prof. T. Matos. *Jun-Oct.13'*
Collaboration visit to give a lecture on 'General cosmology', and mentor three master students in their summer projects.

Physics Department, CINVESTAV. **DF, MX**
Graduate Research Assistant, hosted by Prof. T. Matos. *2007-2008*
"Cosmological models with dynamical systems".

Friedrich-Schiller-Universitat Jena. **Jena, DE**
Short-term research visitor, hosted by Prof. B. Brugmann. *Jun-Sept.06'*
"Numerical methods in Cosmology".

Selected Awards & Scholarships

2013: Member of the National System of Researchers, Level 1 (SNI 1).

2013: PhD award for academic purposes, Cavendish Laboratory, Cambridge.

2012: Tutorial award for academic purposes, St Edmund's College, Cambridge.

2012: American Alumni award, for traveling to the US for studies. St Edmund's College, Cambridge.

2008-2012: SEP Excellence program scholarship, complementary scholarship.

2008-2012: CONACyT full scholarship, for study towards a MASt and PhD, University of Cambridge.

2006: Research grant for young scientists. *Awarded by the German Academic Exchange Service (DAAD).*

2005-2007 : CONACyT full scholarship, for study towards a Master, CINVESTAV.

2004-2005: Undergraduate Research Assistantship (from SNI-III tutor), UAEM-CINVESTAV.

2004 : Undergraduate Teaching Assistantship, UAEM.

Press Release

07.2016: US Department of Energy: Dark Energy Measured With Record-Breaking Map of 1.2 Million Galaxies link

07.2016: LBNL, Berkeley Lab: Dark Energy Measured with Record-Breaking Map of 1.2 Million Galaxies link.

07.2016: Physicsworld: Dark-energy study maps 1.2 million galaxies in the early universe link.

04.2015: APS meeting on behalf of the BOSS Collaboration

06.2012: Talented Mexicans abroad. TV. short interview (Televisa)

Affiliations

2015 –: Member of the APS, AAS.

2014 –: Member of the Advisory Committee for CONACYT projects (RCEA), by invitation.

Referee of projects: 'Installation of a high energy and astroparticle lab', asking for $US 300k; and 'Physics and astrophysics of neutron stars', asking for $US 200k.

2013 –: Member of the SDSS-III/SDSS-IV collaboration, as part of the BOSS/eBOSS experiment.

2012 –: Committee member of the Mexican Cambridge Society.

2006 –: Member of the Institute advanced of cosmology, `http://www.iac.edu.mx/`

2004 –2005: Counselor student at Graduate Internal Council, UAEM.

Publications

For further details and citations: Google Scholar, Inspire, Research gate

[1] The Thirteenth Data Release of the Sloan Digital Sky Survey: First Spectroscopic Data from the SDSS-IV Survey MApping Nearby Galaxies at Apache Point Observatory: Franco D. Albareti *et al.* ArXiv:1608.02013

[2] The clustering of galaxies in the completed SDSS-III Baryon Oscillation Spectroscopic Survey: cosmological analysis of the DR12 galaxy sample: Shadab Alam *et al.* ArXiv:1607.03155

[3] The clustering of galaxies in the completed SDSS-III Baryon Oscillation Spectroscopic Survey: double-probe measurements from BOSS galaxy clustering & Planck data – towards an analysis without informative priors : Marcos Pellejero-Ibanez *et al.* ArXiv:1607.03152

[4] The Clustering of Galaxies in the Completed SDSS-III Baryon Oscillation Spectroscopic Sur-

vey: single-probe measurements from DR12 galaxy clustering – towards an accurate model: Chia-Hsun Chuang *et al.* ArXiv:1607.03151

[5] The clustering of galaxies in the completed SDSS-III Baryon Oscillation Spectroscopic Survey: Baryon Acoustic Oscillations in Fourier-space: Florian Beutler *et al.* ArXiv:1607.03149

[6] The clustering of galaxies in the completed SDSS-III Baryon Oscillation Spectroscopic Survey: combining correlated Gaussian posterior distributions:
Ariel G. Sanchez *et al.* ArXiv:1607.03146

[7] Constraining the dark energy equation of state using Bayes theorem and the Kullback-Leibler divergence: S. Hee *et al.* ArXiv:1607.00270

[8] Hybrid Natural Inflation:
Graham G. Ross, Gabriel German, JAV ArXiv:1601.03221. JHEP 1605 (2016) 010

[9] Broadband distortion modeling in Lyman-α forest BAO fitting:
Michael Blomqvist *et al.* ArXiv:1504.06656. JCAP 1511 (2015) no.11, 034

[10] Large-scale clustering of Lyman-alpha emission intensity from SDSS/BOSS:
Rupert A.C. Croft *et al.* ArXiv:1504.04088. MNRAS. 457 (2016) no.4, 3541-3572

[11] A divergence-free parametrization for dynamical dark energy:
Ozgur Akarsu, Tekin Dereli, JAV. ArXiv:1501.07598. JCAP, 1506 (2015) 06, 049

[12] The Eleventh and Twelfth Data Releases of the Sloan Digital Sky Survey: Final Data from SDSS-III: Shadab Alam *et al.* ArXiv:1501.00963. ApJs 219 (2015) 1, 12

[13] Constraining Hybrid Natural Inflation with recent CMB data: JAV, Mariana Carrillo, Gabriel German, Alfredo Herrera, J.C. Hidalgo. ArXiv:1411.6616. JCAP 1502 (2015) 02, 039

[14] Cosmological Implications of baryon acoustic oscillation (BAO) measurements:
Éric Aubourg *et al.* ArXiv:1411.1074. Phys. Rev. D92 (2015) no.12, 123516

[15] Reciprocity invariance of the Friedmann equation, missing matter and double dark energy:
JAV *et al.* ArXiv:1208.2542. Submitted to PRD

[16] Constraints on the Tensor-to-Scalar ratio for non-power law models: JAV, M. Bridges, Yin-Zhe Ma, M.P. Hobson. ArXiv:1303.4014. JCAP 08(001) 2013

[17] Reconstruction of the Dark Energy equation of state: JAV, M.P. Hobson, M. Bridges, A.N. Lasenby. ArXiv:1205.0847. JCAP, 09(020), 2012

[18] Model selection applied to reconstruction of the Primordial Power Spectrum: JAV, M.P. Hobson, M. Bridges, A.N. Lasenby. ArXiv:1203.1252. JCAP 006(106), 2012

[19] A Bayesian study of the primordial power spectrum from a novel closed universe: JAV, A.N. Lasenby, M.P. Hobson, M. Bridges. ArXiv:1103.4619. MNRAS 422, 1948-1956, 2011

[20] Dynamics of scalar field dark matter with a cosh potential: Tonatiuh Matos, José-Rubén Luévano, Israel Quiros, L. Arturo Urena-López, JAV. ArXiv:0906.0396.PRD 80, 123521, 2009

[21] Self-interacting Scalar Field Trapped in a Randall-Sundrum Braneworld: Tamé González, Tonatiuh Matos, Israel Quiros, JAV. ArXiv:0812.1734. PLB 676, 161-167, 2009

[22] ϕ^2 as Dark Matter:
Tonatiuh Matos, JAV, Juan Magana. ArXiv:0806.0683 MNRAS 393, 1359-1369, 2008

[23] An alternative Interpretation for the Moduli Fields of the Cosmology Associated to Type IIB Supergravity with Fluxes: Tonatiuh Matos, José-Rubén Luevano, Hugo Gracía Compeán, JAV. ArXiv:0511098 IJMPA 23, 1949-1962, 2008

In Preparation (link).

[1p] Cosmological constraints from galaxy-galaxy lensing and galaxy clustering.: Sukhdeep Singh, JAV, Rachel Mandelbaum, Anže Slosar, Uros Seljak Link

[2p] Measurement of BAO correlations at z=2.3 with SDSS DR12 Lyα Forests: BOSS collaboration Link

[3p] Early Dark Energy: Reality and Fiction: JAV, Anže Slosar, Hee-Jong Seo, David Weinberg. Link

[4p] Gaussian Embedding – massively parallelizable sampling algorithm.: JAV, Anže Slosar, Andreu Font-Ribera, Patrick McDonald. Link

[5p] Cosmological constraints on Modified Gravity: JAV, M.P. Hobson, A.N. Lasenby, M. Bridges. Link

[6p] Fourier-law for deceleration parameter.: Ozgur Akarsu, Tekin Dereli, Suresh Kumar, JAV.

Conference Proceedings

[1C] Cosmological Implications of baryon acoustic oscillation (BAO) measurements: Jose Vazquez, APS 6 No 4 (2015)

[2C] Study of Several Potentials as Scalar Field Dark Matter Candidates: Tonatiuh Matos, JAV, Juan Magana. AIP Conf. Proc. 1083, 144-170, 2008. AIP, 808386

[3C] Alternative interpretation for the moduli fields of string theories: Tonatiuh Matos, José Rubén Luevano, L. Arturo Urena, JAV. J. Phys. Conf. Ser. 91, 012014, 2007. JP, 773227

Reviews

[1R] Dark matter in the Universe: goals and challenges: JAV, Tonatiuh Matos. Rev. Mex. de Física E. 54, 193-202, 2008. RMF, 1870-3542

[2R] Constraining Cosmological Inflation: JAV, Tonatiuh Matos. Rev. Mex. Fis. E.

Invited Talks

02.2016: The current status of the Universe. Science Center, NY, US

04.2015: Cosmological implications of BAO measurements: BOSS DR11. APS, MD, US

Plenary talk on behalf of the BOSS Collaboration

04.2015: Gaussian Embedding algorithm and the BAO. CMU, PA, US

03.2015: Cosmology with BAO measurements. Aspen, CO, US

02.2015: The current status of the Universe. Koc University, Istanbul, TR

02.2015: The standard cosmological model: LCDM. ITU, Istanbul, TR

01.2015: Gaussian Embedding algorithm and the SimpleMC code. Berkeley, CA, US

12.2014: Cosmological Implications of BAO measurements. SDSS Meeting, NM, US

Plenary talk on behalf of the BOSS Collaboration

10.2014: BAO implications on Dark Energy constraints. BNL, NY, US

08.2013: Model Selection applied to Dark Energy models. UNAM, MX

09.2013: Dark Energy: Cosmological constant and other alternatives. CINVESTAV, MX
04.2012: Comparison of Cosmological Models with current Observations. Cambridge, UK

Talks-(past five years)

10.2015: The current status of the Universe. BNL, NY, US
06.2014: BAO in the Ly-α forest of BOSS DR11 quasars. BNL, NY, US
09.2013: Dark Energy: Cosmological constant and other alternatives. CINVESTAV, MX
09.2013: Model Selection applied to Dark Energy models. UNAM, MX
09.2013: Energía oscura: alternativas a la constante cosmológica. INAOE, Puebla, MX
02.2013: Constraining alternative models with future observations. IF, UNAM, MX
04.2012: Comparison of Cosmological Models with current Observations. Cambridge, UK
01.2011: An overview of Statistical Cosmology. ININ, MX
01.2011: Constraining cosmological models with current data. CINVESTAV, MX
04.2010: Comparing a novel closed Universe model with CMB data. KICC, Cambridge, UK

Hacking

08.2016: PyData. Chicago, IL, US
07.2016: PyGotham. UN, NY, US
07.2016: Database Camp. NY, US
06.2016: 8th Astronomical Data Analysis Summer School. Chania, GR
01.2015: Symposium and Hack Week on data-intensive cosmology. Berkeley, CA, US
04.2015: SciCoder 6 Workshop. NY, US

Travel grants

06.2016: Summer School in Statistics for Astronomers. Penn State, PA, US
05.2016: Statistical Challenges in 21st Century Cosmology. Chania, GR
04.2015: American Physical Society Meeting. MD, US
08.2014: Workshop on Cosmology from Baryons at High Redshift. Trieste, IT
08.2014: Collaboration Meeting. Cambridge, UK
07.2014: SDSS-III and SDSS-IV Collaboration. Salt Lake City, UT, US
01.2014: Essential Cosmology for the next Generation. Cabo, MX
10.2013: Precision Astronomy with Fully Depleted CCDs. BNL, NY, USA
08.2013: Segunda reunión de estudiantes de Astronomía. INAOE, Puebla, MX
07.2013: Statistical methods applied to modern cosmology. UNAM, MX
05.2012: Testing General Relativity with Astrophysical Systems. Harvard, MA, US
07.2011: New Horizons for High Redshifts. Cambridge, UK
07.2011: PASCOS 2011. Cambridge, UK
01.2011: Essential Cosmology for the Next Generation. Jalisco, MX
12.2010: Fourth TRR33 Winter School. Passo del Tonale, IT
07.2008: Summer school in Cosmology. ICTP, Trieste, IT
05.2008: III International Meeting on Gravitation and Cosmology. Morelia, MX
09.2007: Latin-American School of Physics. DF, MX

08.2007: XXXV SLAC Summer Institute. Stanford, CA, USA
06.2007: International Conference on Quantum Gravity. Morelia, MX
07.2006: New Frontiers in Numerical Relativity. AIE, Berlin, DE
07.2004: XIII Summer at the National Astronomic Observatory. Ensenada, MX

Domestic

08.2009: Cluster de Alto desempeno. UAEH, Hidalgo, MX
02.2008: 1er Congreso de Cosmología. IFUG, MX
09.2007: 2a Reunión del Instituto Avanzado en Cosmología. CRyA-UNAM, MX
07.2007: Advanced Summer School in Physics. CINVESTAV, MX
04.2007: XV Reunión anual de la división de Gravitación y Física Matemática. IPN, MX
01.2007: Obregón Fest. IFUG, MX
01.2007: 1era Reunión Instituto Avanzado de Cosmología. UNAM, MX
11.2006: VII Mexican School on Gravitation. Playa del Carmen, MX
04.2006: XIV Reunión Anual de la División de Gravitación y Física. CINVESTAV, MX
07.2005: IV Mexican School of Astrophysics, EMA 05. Morelia, MX
09.2003: 3rd. Workshop Optica Moderna. INAOE, Puebla, MX
08.2003: XI Summer School on Physics, La visión molecular de la materia. UAEM, Morelos, MX
08.2002: X Summer School on Physics, La visión molecular de la materia. UAEM, Morelos, MX

Organization

09.2013: Workshop Organiser: Statistical and Numerical methods in Cosmology. IF, UNAM, MX
01.2011: Mini-workshop Organiser: overview to CAMB and CosmoMC. ININ, MX
2007-2008: Seminar Organiser, "Geometry and Gravitation". CINVESTAV, MX
2005-2007: Seminar Organiser, "Cosmology, Astrophysics and Numerical R". CINVESTAV, MX
2004-2005: Committee Member, "Consejo Técnico". UAEM, MX
2004-2005: Committee Member, "Consejo Estudiantil de la Sociedad de Alumnos". UAEM, MX
2001-2002: Committee Member, "Consejo Estudiantil de la Sociedad de Alumnos". UAEM, MX

Teaching and Outreach

08.2015: Mentoring a summer high school student, BNL.
10.2015: Mentoring a summer high school student, BNL.
07.2009: Tutor of three Master summer students, CINVESTAV.
2006 : Graduate Research Assistant, *Photo Acoustic Spectroscopy*, CINVESTAV.
2004-2005: Undergraduate Research Assistantship,*Galaxy Formation with dark matter*, UAEM.
2004 : Undergraduate Teaching Assistant, *Mechanics Subject*, UAEM.
2003-2004: Undergraduate Research Assistantship,*Opto-galvatinic spectroscopy of plasmas to low temperature*, UAEM.

Skills and Interests

Programming Languages: Python, C/C++, Fortran, R, Bash Scripting
Maths: Maple, Mathematica, Matlab (basic)

Op. Systems: Linux, Windows, Mac OS X
Design: Latex, HTML, CSS
Databases: MySQL, SQLite
Useful: Gnuplot, Git, SVN

Packages, libraries and frameworks

Python: Numpy, Pandas, Scipy, Scikit-learn, Beatiful Soup, Matplotlib, Bokeh, Seaborn, Flask.
R: dplyr, Main ones for Stats and ML, ggplot2, Shiny
C/C++, Fortran: LAPACK, OpenMP, MPI
HPC Clusters: NERSC(LBNL), Astro (BNL), Darwin (Cambridge), LaSuma-(CINVESTAV)

Cosmology

CAMB, CosmoMC, MultiNest, CosmoNet, CosmoSIS, SimpleMC.

Contributions: MCMC for BAO analysis for the BOSS collaboration (Python) - SimpleMC
. Massively parallelizable Gaussian Embedding Sampling (Python) - GM algorithm
. Model Independent Bayesian Reconstruction (Fortran) - NP-CAMB
Lyman-α analysis for the BOSS collaboration (C++) - Cosmology

Non-Academic Projects

Scraping the web, Using APIs, Data manipulation with Pandas and SQL, Playing with Stats and ML algorithms and Visualizations.

Meetups: I regularly attend NYC meetups with keywords such as Python, R, SQL, Data science.

For further details see: GitHub, Bitbucket.

Others

Languages: Spanish (Native); English (Fluent); German (Elementary).
Sports: Football (participation on national tournaments), Squash, Climbing, Jogging, Cycling.
Organiser of the national football tournament of Mexican Societies in UK (05.2010).
Others: Reading: Economy, Science, Science Fiction; Board games: Chess, Backgammon, Poker.

References

Anže Slosar — **Brookhaven National Lab**
Upton, 11973, NY, US. Tel: +1 (631) 344 8012. — *anze@bnl.gov*

Mike Hobson — **University of Cambridge**
Cavendish Laboratory, CB3 0HE, UK. Tel: +44 1223 339992. — *mph@mrao.cam.ac.uk*

Anthony Lasenby — **University of Cambridge**
Kavli Institute for Cosmology, CB3 0HA, UK. Tel: +44 1223 337293. — *a.n.lasenby@mrao.cam.ac.uk*

Tonatiuh Matos — **CINVESTAV**
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JAV