

José Alberto Vázquez | Centro de Investigación y de Estudios Avanzados del IPN

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Current Position

Centro de Investigación y de Estudios Avanzados [CINVESTAV] del IPN. CDMX, MX
Catedrático CONACYT, Prof. O. Miranda & Prof. T. Matos. Oct.2016 -
Member of the SDSS-III/SDSS-IV collaboration. ¹

Research Interests

BAO, CMB, Lyman- α forest; Dark Energy, Inflation; Data analysis. [Website](#), [LinkedIn](#), [GitHub](#)
http://www.cosmo.bnl.gov/www/jvazquez/

Place and Birth date

Cuernavaca, Morelos México. 06-Septiembre-1982.

Education and Work Experience

Brookhaven National Lab [BNL], U.S. Department of Energy. NY, USA
Post-doctoral Research Associate, Prof. A. Slosar. 2013-2016
“Cosmological Implications of BAO measurements and Lyman- α forest analysis”

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, UAEM 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.

Acronyms: Sloan Digital Sky Survey [SDSS], Baryon Acoustic Oscillations [BAO], Cosmic Microwave Background [CMB].

Physics Department, CINVESTAV.
Graduate Research Assistant, hosted by Prof. T. Matos.
"Cosmological models with dynamical systems".

DF, MX
2007-2008

Friedrich-Schiller-Universitat Jena.
Short-term research visitor, hosted by Prof. B. Bruggmann.
"Numerical methods in Cosmology".

Jena, DE
Jun-Sept.06'

Selected Awards & Scholarships

2015: Invited for a plenary talk on behalf of the BOSS collaboration to the APS meeting. ²
2014: Invited for a plenary talk on behalf of the BOSS collaboration to the SDSS-IV meeting.
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. [link](#)
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.

Acronyms: Baryon Oscillation Spectroscopic Survey [BOSS], American Physical Society [APS], American Astronomical Society [AAS], Lawrence Berkeley National Laboratory [LBNL], Data Release 20* [DR*].

Publications

For further details and citations:

[Google Scholar](#) (Cites:831)

[1] **Galaxy-galaxy lensing estimators and their covariance properties::** Sukhdeep Singh, Rachel Mandelbaum, Uroš Seljak, Anže Slosar, JAV. Cites: 0

ArXiv:1611.00752,

[Submitted to MNRAS](#)

[2] **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.* Cites: 4

ArXiv:1608.02013,

[Submitted to ApJS](#)

[3] **The clustering of galaxies in the completed SDSS-III Baryon Oscillation Spectroscopic Survey: cosmological analysis of the DR12 galaxy sample:** Shadab Alam *et al.* Cites: 13

ArXiv:1607.03155,

[Submitted to MNRAS](#)

[4] **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.* Cites: 0

ArXiv:1607.03152,

[Submitted to MNRAS](#)

[5] **The Clustering of Galaxies in the Completed SDSS-III Baryon Oscillation Spectroscopic Survey: single-probe measurements from DR12 galaxy clustering – towards an accurate model:** Chia-Hsun Chuang *et al.* Cites: 26

ArXiv:1607.03151,

[Submitted to MNRAS](#)

[6] **The clustering of galaxies in the completed SDSS-III Baryon Oscillation Spectroscopic Survey: Baryon Acoustic Oscillations in Fourier-space:** Florian Beutler *et al.* Cites: 3

ArXiv:1607.03149,

[DOI: 10.1093/mnras/stw2373], [MNRAS 464 \(3\): 3409-3430](#)

[7] **The clustering of galaxies in the completed SDSS-III Baryon Oscillation Spectroscopic Survey: combining correlated Gaussian posterior distributions:** Ariel G. Sanchez *et al.* Cites: 2

ArXiv:1607.03146,

[DOI: 10.1093/mnras/stw2495], [MNRAS 464 \(2\): 1493-1501](#)

[8] **Constraining the dark energy equation of state using Bayes theorem and the Kullback-Leibler divergence:** S. Hee *et al.* Cites: 0

ArXiv:1607.00270,

[DOI: 10.1093/mnras/stw3102], [MNRAS \(2016\)](#)

[9] **Hybrid Natural Inflation:** Graham G. Ross, Gabriel German, JAV. Cites: 4

ArXiv:1601.03221,

[DOI: 10.1007/JHEP05(2016)010], [JHEP 1605 \(2016\) 010](#)

[10] **Broadband distortion modeling in Lyman- α forest BAO fitting:** Michael Blomqvist *et al.* Cites: 3

ArXiv:1504.06656,

[DOI: 10.1088/1475-7516/2015/11/034], [JCAP 1511 \(2015\) no.11, 034](#)

[11] **Large-scale clustering of Lyman-alpha emission intensity from SDSS/BOSS:** Rupert A.C. Croft *et al.* Cites: 9

ArXiv:1504.04088,

[DOI: 10.1093/mnras/stw204], [MNRAS 457 \(4\): 3541-3572.](#)

[12] **A divergence-free parametrization for dynamical dark energy:** Ozgur Akarsu, Tekin Dereli, JAV. Cites: 5

ArXiv:1501.07598,

[DOI: 10.1088/1475-7516/2015/06/049], [JCAP, 1506 \(2015\) 06, 049](#)

[13] **The Eleventh and Twelfth Data Releases of the Sloan Digital Sky Survey: Final Data from SDSS-III:** Shadab Alam *et al.* Cites: 458

- ArXiv:1501.00963, [DOI: 10.1088/0067-0049/219/1/12], [ApJs 219 \(2015\) 1, 12](#)
- [14] **Constraining Hybrid Natural Inflation with recent CMB data:** JAV, Mariana Carrillo, Gabriel German, Alfredo Herrera, J.C. Hidalgo. Cites: 5
ArXiv:1411.6616, [DOI: 10.1088/1475-7516/2015/02/039], [JCAP 1502 \(2015\) 02, 039](#)
- [15] **Cosmological Implications of baryon acoustic oscillation (BAO) measurements:** Éric Aubourg *et al.* Cites: 114
ArXiv:1411.1074, [DOI:PhysRevD.92.123516], [Phys. Rev. D92 \(2015\) no.12, 123516](#)
- [16] **Reciprocity invariance of the Friedmann equation, missing matter and double dark energy:** JAV *et al.* Cites: 2
ArXiv:1208.2542, [Submitted to PRD](#)
- [17] **Constraints on the Tensor-to-Scalar ratio for non-power law models:** JAV, M. Bridges, Yin-Zhe Ma, M.P. Hobson. Cites: 9
ArXiv:1303.4014, [DOI:10.1088/1475-7516/2013/08/001], [JCAP 08\(001\) 2013](#)
- [18] **Reconstruction of the Dark Energy equation of state:** JAV, M.P. Hobson, M. Bridges, A.N. Lasenby. Cites: 23
ArXiv:1205.0847, [DOI: 10.1088/1475-7516/2012/09/020], [JCAP, 09\(020\), 2012](#)
- [19] **Model selection applied to reconstruction of the Primordial Power Spectrum:** JAV, M.P. Hobson, M. Bridges, A.N. Lasenby. Cites: 31
ArXiv:1203.1252, [DOI: 10.1088/1475-7516/2012/06/006], [JCAP 006\(106\), 2012](#)
- [20] **A Bayesian study of the primordial power spectrum from a novel closed universe:** JAV, A.N. Lasenby, M.P. Hobson, M. Bridges. Cites: 11
ArXiv:1103.4619, [DOI: 10.1111/j.1365-2966.2012.20606.x], [MNRAS 422, 1948-1956, 2011](#)
- [21] **Dynamics of scalar field dark matter with a cosh potential:** Tonatiuh Matos, José-Rubén Luévano, Israel Quiros, L. Arturo Urena-López, JAV. Cites: 33
ArXiv:0906.0396, [DOI: 10.1103/PhysRevD.80.123521], [PRD 80, 123521, 2009](#)
- [22] **Self-interacting Scalar Field Trapped in a Randall-Sundrum Braneworld:** Tamé González, Tonatiuh Matos, Israel Quiros, JAV. Cites: 6
ArXiv:0812.1734, [DOI: 10.1016/j.physletb.2009.04.080], [PLB 676, 161-167, 2009](#)
- [23] **ϕ^2 as Dark Matter:** Tonatiuh Matos, JAV, Juan Magana. Cites: 60.
ArXiv:0806.0683, [DOI: 10.1111/j.1365-2966.2008.13957.x], [MNRAS 393, 1359-1369, 2008](#)
- [24] **An alternative Interpretation for the Moduli Fields of the Cosmology Associated to Type IIB Supergravity with Fluxes:** Tonatiuh Matos, José-Rubén Luevano, Hugo Gracia Compeán, JAV. Cites: 11
ArXiv:0511098, [IJMPA 23, 1949-1962, 2008](#)

Conference Proceedings.....

- [1C] **Cosmological Implications of baryon acoustic oscillation (BAO) measurements:** Jose Vazquez. Cites: 2, [APS 6 No 4 \(2015\)](#)
- [2C] **Study of Several Potentials as Scalar Field Dark Matter Candidates:** Tonatiuh Matos, JAV, Juan Magana. Cites: 0, 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. Cites:0, 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. Cites: 0. [RMF, 1870-3542](#)

[2R] **Constraining Cosmological Inflation:** JAV, Tonatiuh Matos. Cites: 0. [Rev. Mex. Fis. E.](#)

In Preparation (link).....

[1p] **Measurement of BAO correlations at $z=2.3$ with SDSS DR12 $\text{Ly}\alpha$ Forests:**

BOSS collaboration

[Link](#)

[2p] **Early Dark Energy: Reality and Fiction:**

JAV, Anže Slosar, Hee-Jong Seo, David Weinberg.

[Link](#)

[3p] **Gaussian Embedding – massively parallelizable sampling algorithm.:**

JAV, Anže Slosar, Andreu Font-Ribera, Patrick McDonald.

[Link](#)

[4p] **Cosmological constraints on Modified Gravity:**

JAV, M.P. Hobson, A.N. Lasenby, M. Bridges.

[Link](#)

[5p] **Fourier-law for deceleration parameter.:** Ozgur Akarsu, Tekin Dereli, Suresh Kumar, JAV.

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 $\text{Ly-}\alpha$ 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 desempeño.	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

08.2016: Mentoring a summer high school student, BNL.	
10.2015: Mentoring a summer high school student, BNL.	
07.2013: Tutor of three Master summer students, CINVESTAV.	
2006 : Graduate Research Assistant, <i>Photo Acoustic Spectroscopy</i> , CINVESTAV.	
2004-2005: Undergraduate Research Assistantship, <i>Galaxy Formation with dark matter</i> , UAEM.	
2004 : Undergraduate Teaching Assistant, <i>Mechanics Subject</i> , UAEM.	
2003-2004: Undergraduate Research Assistantship, <i>Opto-galvanic spectroscopy of plasmas to low temperature</i> , 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) ³

Cosmology codes.....

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 Machine Learning algorithms and Visualizations.

Meetups: Regularly attending 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

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Acronyms: High Performace Computing [HPC], Application Programming Interface [API], Structured Query Language [SQL], Markov chain Monte Carlo [MCMC].