José-Alberto Vázquez

Brookhaven National Lab, U.S. Department of Energy

Current Position

Oct.2013 - **Post-doctoral Research Associate**, *Brookhaven National Lab*, NY, USA.

Member of the SDSS-III/SDSS-IV collaboration.

Project: *"Cosmological Implications of BAO measurements and Lyman-α forest analysis"*

My current research is mainly focussed on the data analysis of the Lyman-α forest observed through BOSS; on the parameter estimation and model selection of Dark Energy and Inflationary models.

Website, LinkedIn, GitHub

Education and Work Experience

2009-2013 **Ph.D. in Astrophysics**, *KICC*, University of Cambridge, UK.

"Constraining alternative cosmological models with current and future observations". We present advanced Bayesian techniques -the computation of the Bayesian evidence, nested sampling and neural network algorithms- to compare cosmological models in the light of the currently available data and forecasts for the next generation of experiments.

2008-2009 **MASt. in Mathematics**, *DAMTP, University of Cambridge, UK.*

"Constraining cosmological Inflation". With the use of current and future surveys, we show constraints on the Inflationary parameters that allow us to make the connection between theoretical and observational cosmology.

2005-2007 **M.Sc. in Physics**, *Physics Department*, CINVESTAV, MX.

"Dynamical systems in Scalar Field Cosmologies". We use the dynamical systems formalism to study the stability of scalar fields as the main candidates of Dark Matter.

2000-2005 **B.Sc. in Physics**, *Faculty of Sciences*, UAEMor, MX.

"Galaxy formation with scalar-field dark matter". We present the general picture of the Dark matter and study several candidates, in particular single scalar fields.

Research Internships

Jun-Oct.13' **Visiting Researcher**, *Physics Department, CINVESTAV*, MX.

Collaboration visit where I present several lectures about 'General cosmology' in the physics department, and mentored three master students in their summer projects.

2007-2008 **Graduate Research Assistant**, *Physics Department*, CINVESTAV, MX.

"Cosmological models with dynamical systems". Prof. T. Matos.

Jun-Sept.06' **Short-term research visitor**, *Friedrich-Schiller-Universitat*, Jena, DE.

"Numerical methods in Cosmology". The aim of this visit was to learn and work with numerical techniques in order to solve basic gravitational wave equations.

Selected Awards & Scholarships

2015 Selected to present a plenary talk on behalf of the BOSS collaboration to the American Physical Society (APS) meeting 2015.

2014 Selected to present a plenary talks on behalf of the BOSS collaboration to the SDSS-IV meeting.

2013 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.

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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), UAEM-CINVESTAV.

2004 Undergraduate Teaching Assistantship, UAEM.

Publications & Academic experience

Publications Author of 20 publications in distinguished journals, two conference proceedings and two science review papers. Over half of the papers as a principal author, and one of them leading a collaboration of more than a hundred author-paper. Research in progress.

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

Invited talks I have presented my research throughout several talks, but in particular I was invited to give plenary talks on behalf of the BOSS collaboration to the American Physical Society (APS) meeting 2015 and to the SDSS-III and SDSS-IV 2014 collaboration meetings. Other institutions include: CMU, PA; Aspen, CO; ITU, Istanbul; Berkeley, CA; UNAM, MX; CINVESTAV, MX; Cambridge, UK.

Travel grants I have also been awarded with travel grants to attend conferences and workshops, and present shorts a short talk. Some of the institutions include: ICTP, Trieste, IT; Cambridge, UK; SLC, UT, USA; Cabo, MX; Harvard, MA, USA; Passo del Tonale, IT; Stanford, CA, USA; AIE, Berlin, DE; Ensenada, MX.

Organization Workshop Organiser: “Statistical and Numerical methods in Cosmology" (50 participants), IF, UNAM. Mini-workshop Organiser: “Overview to CAMB and CosmoMC" (15 participants), ININ. Seminar group Organiser: “Geometry and Gravitation”, CINVESTAV. Seminar group Organiser: “Cosmology, Astrophysics and Numerical relativity”, CINVESTAV.

Hacking (01.2015) Symposium and Hack Week on data-intensive cosmology. Berkeley, CA, USA. link

(04.2015) SciCoder 6 Workshop. NY, USA. link

Statistical methods for cosmology, Astrostatistics and R (Eric Feigelson, PennState U.)

Applied Bayesian Statistics - with R (David Spiegelhalter, Cambridge)

Bayesian methods in Cosmology (Mike Hobson -PhD advisor - Cambridge)

Skills and Interests

I have been involved in several projects where programming skills are a key factor. Some of the programming languages and software that I used the most include:

Programming C/C++, Fortran, Python, R (basic) Matlab, Maple (basic), Mathematica.

Useful OpenMP, MPI, mpi4py Git/svn, Markdown, Markup(Latex/HTML)

Op. Systems Unix, Linux, Windows, Mac OS X.

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

Contributions SimpleMC(MCMC for BAO analysis in BOSS), GE algorithm (New Sampling Algorithm) Cosmology (BOSS Lyman-α analysis), NP-CAMB (Bayesian Reconstruction).

* For further details see: GitHub, Bitbucket

Others

Languages Native Spanish; fluent English; elementary German.

Sports Football (participation on national tournaments), Squash, Climbing, Jogging, Cycling.

Organiser of the national football tournament of Mexican Societies in UK -150 attendees- (05.2010).

Others Reading: Economy, Science, Science Fiction; Board games: Chess, Backgammon, Poker.

Extra Online trader (Stocks/ETFs).