

---

## Current Position

Oct.2013 - **Post-doctoral Research Associate**, *Brookhaven National Lab, NY, USA.*  
*"Cosmological Implications of BAO measurements and Lyman- $\alpha$  forest analysis"*  
Member of the SDSS-III/SDSS-IV collaboration. Dr. A. Slosar  
Interests BAO, CMB, Ly- $\alpha$  forest; Dark Energy, Inflation; Data analysis.  
[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".*  
Prof. A. Lasenby and Prof. M. Hobson.  
2008-2009 **MASt. in Mathematics**, *DAMTP, University of Cambridge, UK.*  
*"Constraining cosmological Inflation".* Dr. A. Challinor  
2005-2007 **M.Sc. in Physics**, *Physics Department, CINVESTAV, MX.*  
*"Dynamical systems in Scalar Field Cosmologies".* Prof. T. Matos.  
2000-2005 **B.Sc. in Physics**, *Faculty of Sciences, UAEMor, MX.*  
*"Galaxy formation with scalar-field dark matter".* Prof. T. Matos.

### Research Internships

Jun-Oct.13' **Visiting Researcher**, *Physics Department, CINVESTAV, MX.*  
Prof. T. Matos.  
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".* Prof. B. Bruggmann.

---

## Affiliations

2015 – Member of the APS, AAS.  
2014 – Member of the Advisory Committee for CONACYT projects (RCEA), by invitation.  
2013 – Member of the SDSS-III/SDSS-IV collaboration, as part of the BOSS/eBOSS experiment.  
2013 – National System of Researchers, Level 1 (SNI 1).  
2012 – Committee member of the Mexican Cambridge Society.  
2006 – Member of the Institute advanced of cosmology, <http://www.iac.edu.mx/>

---

## Scholarships & Awards

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.

## Publications

- \* For further details and citations: [Google Scholar](#), [Inspire](#), [Research gate](#)
- [1] Michael Blomqvist *et al.* *Broadband distortion modeling in Lyman- $\alpha$  forest BAO fitting.*  
Submitted to JCAP. [arXiv:1504.06656](#)
  - [2] Rupert A.C. Croft *et al.* *Large-scale clustering of Lyman-alpha emission intensity from SDSS/BOSS.*  
Submitted to MNRAS. [arXiv:1504.04088](#)
  - [3] Ozgur Akarsu, Tekin Dereli, JAV. *A divergence-free parametrization for dynamical dark energy.*  
JCAP, 1506 (2015) 06, 049. [arXiv:1501.07598](#)
  - [4] Shadab Alam *et al.* *The Eleventh and Twelfth Data Releases of the Sloan Digital Sky Survey: Final Data from SDSS-III.* ApJs 219 (2015) 1, 12. [arXiv:1501.00963](#)
  - [5] JAV, Mariana Carrillo, Gabriel German, Alfredo Herrera, J.C. Hidalgo. *Constraining Hybrid Natural Inflation with recent CMB data.* JCAP 1502 (2015) 02, 039. [arXiv:1411.6616](#)
  - [6] Éric Aubourg *et al.* *Cosmological Implications of baryon acoustic oscillation (BAO) measurements.* Accepted to PRD. [arXiv:1411.1074](#)
  - [7] JAV *et al.* *Reciprocity invariance of the Friedmann equation, missing matter and double dark energy.* Submitted to PRD. [arXiv:1208.2542](#)
  - [8] JAV, M. Bridges, Yin-Zhe Ma, M.P. Hobson. *Constraints on the Tensor-to-Scalar ratio for non-power law models.* JCAP 08(001) 2013, [arXiv:1303.4014](#)
  - [9] JAV, M.P. Hobson, M. Bridges, A.N. Lasenby. *Reconstruction of the Dark Energy equation of state.* JCAP, 09(020), 2012. [arXiv:1205.0847](#)
  - [10] JAV, M.P. Hobson, M. Bridges, A.N. Lasenby. *Model selection applied to reconstruction of the Primordial Power Spectrum.* JCAP 006(106), 2012. [arXiv:1203.1252](#)
  - [11] JAV, A.N. Lasenby, M.P. Hobson, M. Bridges. *A Bayesian study of the primordial power spectrum from a novel closed universe.* MNRAS 422, 1948-1956, 2011. [arXiv:1103.4619](#)
  - [12] Tonatiuh Matos, José-Rubén Luévano, Israel Quiros, L. Arturo Urena-López, JAV. *Dynamics of scalar field dark matter with a cosh potential.* PRD 80, 123521, 2009. [arXiv:0906.0396](#)
  - [13] Tamé González, Tonatiuh Matos, Israel Quiros, JAV. *Self-interacting Scalar Field Trapped in a Randall-Sundrum Braneworld.* PLB 676, 161-167, 2009. [arXiv:0812.1734](#)
  - [14] Tonatiuh Matos, JAV, Juan Magana.  *$\phi^2$  as Dark Matter.* MNRAS 393, 1359-1369, 2008. [arXiv:0806.0683](#)
  - [15] Tonatiuh Matos, José-Rubén Luevano, Hugo Gracia Compeán, JAV. *An alternative Interpretation for the Moduli Fields of the Cosmology Associated to Type IIB Supergravity with Fluxes.* IJMPA 23, 1949-1962, 2008. [arXiv:0511098](#)

## In Preparation

- [1p] BOSS Collaboration. *The clustering of galaxies in the SDSS-III Baryon Oscillation Spectroscopic Survey: Baryon Acoustic Oscillations in the Data Release 12 Galaxy Sample.*

- [2p] JAV, Anže Slosar, Hee-Jong Seo, David Weinberg. *Early Dark Energy: Reality and Fiction.*
- [3p] JAV, Anže Slosar, Andreu Font-Ribera, Patrick McDonald. *Gaussian Embedding – massively parallelizable sampling algorithm.*
- [4p] Sukhdeep Singh, Rachel Mandelbaum, Anže Slosar, JAV. *Cosmological constraints from galaxy-galaxy lensing and galaxy clustering.*
- [5p] Ozgur Akarsu, Tekin Dereli, Suresh Kumar, JAV. *Cosine-law for deceleration parameter.*
- [6p] Gabriel German, Graham Ross, JAV. *Observable bounds in Hybrid Natural Inflation from sub-Planckian field excursion.*
- [7p] JAV, M.P. Hobson, A.N. Lasenby, M. Bridges. *Cosmological constraints on Modified Gravity.*
- [8p] S. Hee, JAV, W. Handley, A.N. Lasenby, M.P. Hobson. *Analysis of Data Variations from a Constant Dark Energy Equation of State.*

## Reviews

- [1R] JAV, Tonatiuh Matos. *Dark matter in the Universe: goals and challenges.* *Rev. Mex. de Física E.* 54, 193-202, 2008. [RMF, 1870-3542](#)
- [2R] JAV, Tonatiuh Matos. *Constraining Cosmological Inflation.* Accepted for publication by *Rev. Mex. Fis. E.*

## Conference Proceedings

- [1C] Tonatiuh Matos, JAV, Juan Magana. *Study of Several Potentials as Scalar Field Dark Matter Candidates.* *AIP Conf. Proc.* 1083, 144-170, 2008. [AIP, 808386](#)
- [2C] Tonatiuh Matos, José Rubén Luevano, L. Arturo Urena, JAV. *Alternative interpretation for the moduli fields of string theories.* *J. Phys. Conf. Ser.* 91, 012014, 2007. [JP, 773227](#)

## Invited Talks

- 04.2015 Cosmological implications of BAO measurements: BOSS DR11. APS Meeting, MD, USA
- 03.2015 Gaussian Embedding algorithm and the BAO. CMU, PA, USA
- 03.2015 Cosmology with BAO measurements. Aspen, CO, USA
- 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, USA
- 12.2014 Cosmological Implications of BAO measurements. BOSS Meeting, NM, USA
- 10.2014 BAO implications on Dark Energy constraints. BNL, NY, USA
- 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)

- 06.2014 BAO in the Ly- $\alpha$  forest of BOSS DR11 quasars. BNL, NY, USA
- 09.2013 Dark Energy: Cosmological constant and other alternatives. CINVESTAV, MX
- 09.2013 Model Selection applied to Dark Energy models. UNAM, MX
- 09.2013 La energía oscura del universo: 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

Brookhaven Nat. Lab. – Bldg. 510-A, Upton NY. 11973

☎ +1 631 344 4060 • 📞 +1 631 992 0730 • ✉ [jvazquez@bnl.gov](mailto:jvazquez@bnl.gov)

JA Vazquez

3/5

04.2010 Comparing a novel closed Universe model with CMB data. KICC, Cambridge, UK

---

## Hacking

01.2015 Symposium and Hack Week on data-intensive cosmology. Berkeley, CA, USA  
04.2015 SciCoder 6 Workshop. NY, USA

---

## Travel grants

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, USA  
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, USA  
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, Frontiers in Contemporary 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-Matemática. 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 and Outreach

09.2013 Workshop Organiser: Statistical and Numerical methods in Cosmology, IF, UNAM

- 01.2011 Mini-workshop Organiser: overview to CAMB and CosmoMC, ININ
- 2007-2008 Seminar group Organiser, “Geometry and Gravitation”, CINVESTAV.
- 2005-2007 Seminar group Organiser, “Cosmology, Astrophysics and Numerical relativity”, CINVESTAV.
- 2004-2005 Committee Member, “Consejo Técnico”, UAEM.
- 2004-2005 Committee Member, “Consejo Estudiantil de la Sociedad de Alumnos”, UAEM.
- 2001-2002 Committee Member, “Consejo Estudiantil de la Sociedad de Alumnos”, UAEM.
- 10.2015 Mentoring a high school student, BNL.
- 07.2009 Tutor of three 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-galvanic spectroscopy of plasmas to low temperature*, UAEM.

## Skills and Interests

- Programming Fortran 90, C/C++, Python, basic R
- Maths Maple, Mathematica, Matlab.
- Parallel OpenMP, MPI, mpi4py
- Useful Git/SVN, Latex, Markup.
- Cosmology CAMB, CosmoMC, MultiNest, CosmoNet, SimpleMC.
- Code [SimpleMC](#) (MCMC for BAO analysis in BOSS), [GE algorithm](#) (Sampling Algorithm)
- contribution [Cosmology](#) (BOSS Lyman- $\alpha$  analysis), [NP-CAMB](#) (Bayesian Reconstruction).

## 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 (05.2010).
- Others Reading: Economy, Science, Science Fiction; Board games: Chess, Backgammon, Poker.
- Extra Online Stocks/ETFs trader.

## References

**Anže Slosar**, *Physics Department*, Brookhaven National Lab, Upton, 11973, NY, USA.

Tel: +1 (631) 344 8012, email: anze@bnl.gov

**Mike Hobson**, *Cavendish Laboratory*, University of Cambridge, CB3 0HE, UK.

Tel: +44 1223 339992, Fax: +44 1223 354599, email: mph@mrao.cam.ac.uk

**Anthony Lasenby**, *Kavli Institute for Cosmology*, University of Cambridge, CB3 0HA, UK.

Tel: +44 1223 337293, Fax: +44 1223 354599, email: a.n.lasenby@mrao.cam.ac.uk

**Tonatiuh Matos**, *Physics Department*, CINVESTAV, Mexico D.F, 14-740 07000, MX.

Tel: +52 55 5747 3834, Fax: +52 55 5747 3387, email: tmatos@fis.cinvestav.mx