

Alice Pisani

Curriculum Vitae

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Research work, education, and internships

- 2017–today **Current position: Post Doc Research Associate**, *Princeton*, working with **Prof David Spergel**, at the Department of Astrophysical Sciences at **Princeton University**.
- 2014–2017 **Post Doctoral fellow**, *Marseille*, working with **Dr Stéphanie Escoffier**, at the Centre de Physique des Particules de Marseille (CPPM) and external collaborator at IAP until 2016 (Institut d'Astrophysique de Paris) and LAM until 2015 (Laboratoire d'Astrophysique de Marseille).
- 2011–2014 **Doctor of Philosophy (Ph.D.)**, at the *Institut d'Astrophysique de Paris (IAP) and Université Pierre et Marie Curie (Sorbonne Universities, ED 127)*, under the supervision of **Prof Ben D. Wandelt**. The title of the PhD thesis is "Cosmology with Cosmic Voids", discussed the 22/09/2014 and obtained with "mention très honorable". The jury for the defence was composed of James Bartlett, Valérie de Lapparent, Stéphanie Escoffier, Luigi Guzzo, Michael Joyce, Rien van de Weygaert, and Benjamin D. Wandelt.
- Spring 2010 **Two months research project**, *Oxford, England*, at the Department of Astrophysics at the **University of Oxford**, under the supervision of **Professor J. Silk**, Savilian Chair of Astronomy at Oxford and Professor of the Université Pierre et Marie Curie, the project was supported by the AST (Italian Science and Technology Association).
- 2009–2010 **Internship for 6 months in Astrophysics**, *Rome, INAF (Italian National Institute of Astrophysics) and CNR (Italian National Council of Research)*, developed an algorithm (using IDL workbench) to simulate stellar fields, testing the source detection program actually in use at the IFSI (Institute of Spatial and Interplanetary Physics) for the data analysis of images from the Herschel satellite, under the supervision of Prof. Sergio Molinari (PI of Herschel infrared Galactic Plane Survey).

- 2009-2011 **Master of Science (2 years) in Astronomy and Astrophysics**, *University of Rome "Sapienza", Italie, with the final mark of: 110/110 summa cum laude.* The title of the Master thesis is "Constraints on the processes of non-standard recombination from anisotropies of the CMB"), under the supervision of Prof. Alessandro Melchiorri.
- Feb. 2008 **Laurea triennale (bachelors degree)**, *University "Sapienza" of Rome, Italie, final mark: 110/110, Dissertation title: "L'energia Oscura" ("Dark energy").*
- 2004 **Baccalauréat Général, série S**, *french school of Rome: Lycée Chateaubriand, Italie and "Maturità Italiana".*
- 2003 **Orientation course at Scuola Normale Superiore**, *Colle Val d'Elsa, Italie, selected for the Orientation course of the Scuola Normale Superiore di Pisa.*
- 1996-2000 **Lycée Franco-Argentin Jean Mermoz**, *Buenos Aires, Argentine.*

Awards

- 2017 **Winner of the Eberly Postdoctoral Fellowship at Penn State**, *declined.*
- 2016 **Winner of the L'Oréal-UNESCO award FWIS 2016.**
- 2011 **Winner of the 3-years fellowship Erasmus Mundus Doctorate Fellowship (relativistic astrophysics)**, *declined.*
- 2010 **Winner of the scholarship of the AST (Italian Science and Technology Association)**, for a two months research project (April-May 2010) at the University of Oxford (UK), under the supervision of Professor J. Silk, Savilian Chair of Astronomy

Involvement in Scientific Collaborations

- Member of **Member of the HLS Cosmology Team**, aiming to prepare the extraction of WFIRST cosmological constraints from voids provided by the WFIRST NASA mission.
- Member of **Member of the Prime Focus Spectroscopy Cosmology Team**, focusing on PFS cosmological constraints from large scale structure clustering analysis.

Euclid Consortium Member **Leader of the “EuclidVoids” group**, (with A. Hawken) in the “New Probes” WP. Work mainly focused on cosmological forecasts and constraints from voids.

Member of the eBOSS Collaboration **Leader of Project 064: “Cosmology with cosmic voids”**, aiming to provide **void catalogs** for the collaboration and extract cosmological constraints; and collaborator for project 104.

Publications

19 papers: refereed papers, proceedings – 6 as first author, 5 as major author (2nd or 3rd)

Published **12 papers**, 1 by *Phys. Rev. Letters*; 3 by *MNRAS*; 2 by *Physical Review D*; 1 by *Journal of Cosmology and Astroparticle Physics*; 1 by *Astrophysical Journal*; 1 by *The Astronomical Journal*, 2 by *The Astrophysical Journal Supplement Series*; 1 by *Astronomy & Computing*.

Submitted **2 papers**, 2 to *MNRAS*.

Conference Proceedings **5 papers**, 2 proceedings of the *IAU Symposium 308*; 1 of the *Marcel Grossmann Meeting 2015*; 2 proceedings of the *International School of Physics “Enrico Fermi” of the Italian Physical Society*.

Detailed List

- [1] **Multipole analysis of redshift-space distortions around cosmic voids**, Nico Hamaus, M.-C. Cousinou, **Alice Pisani**, M. Aubert, S. Escoffier and J. Weller, accepted by **Journal of Cosmology and Astroparticle Physics**: JCAP07(2017)014 (arXiv:1705.05328).
- [2] **The Fourteenth Data Release of the Sloan Digital Sky Survey: First Spectroscopic Data from the extended Baryon Oscillation Spectroscopic Survey and from the second phase of the Apache Point Observatory Galactic Evolution Experiment**, *SDSS Collaboration*: Abolfathi B., [...], **Pisani A.**, et al. , accepted by **Astronomical Journal**: Volume 154, Number 1, pp. 28-62 (2017) (arXiv:1703.00052).
- [3] **Sloan Digital Sky Survey IV: Mapping the Milky Way, Nearby Galaxies, and the Distant Universe**, *SDSS Collaboration*: Blanton M. R., [...], **Pisani A.**, et al. , accepted by **The Astrophysical Journal Supplement Series**: Volume 154, Number 1, pp. 28-62 (2017) (arXiv:1707.09322).

- [4] **Constraints on Cosmology and Gravity from the Dynamics of Voids**, *Hamaus N., Pisani A., Sutter, P. M., Lavaux G., Escoffier S., Wandelt B. D., and Weller J.*, accepted by **Physical Review Letters**: Phys. Rev. Lett. 117, 091302 (arXiv:1602.01784).
- [5] **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**, *SDSS Collaboration: Albareti F. D., [...], Pisani A., et al.*, accepted by **Astrophysical Journal Supplement Series** (arXiv:1608.02013).
- [6] **Power law cosmology model comparison with CMB scale information**, *Tutusaus I., [...], Pisani A., et al.*, accepted by **Physical Review D**: Phys. Rev D 94, 103511 (arXiv:1610.03371).
- [7] **Jackknife resampling technique on mocks: an alternative method for covariance matrix estimation**, *Escoffier S., Cousinou M.-C., Tilquin A., Pisani A., Aguichine A., de la Torre S., Ealet A., Gillard W., and Jullo E.*, submitted to **Monthly Notices of the Royal Astronomical Society** (arXiv:1606.00233).
- [8] **Mastering the effects of peculiar velocities on voids**, *Pisani A., Sutter, P. M., and Wandelt, B. D.*, submitted to **Monthly Notices of the Royal Astronomical Society** (arXiv:1506.07982).
- [9] **Counting voids to probe dark energy**, *Pisani A., Sutter, P. M., Hamaus N., Alizadeh E., Biswas R., Wandelt, B. D. and Hirata C. D.*, accepted by **Physical Review D**: Phys. Rev. D 92, 083531 (arXiv:1503.07690).
- [10] **The SDSS-IV extended Baryon Oscillation Spectroscopic Survey: Overview and Early Data**, *eBOSS Collaboration: Dawson K., [...], Pisani A., et al.*, accepted by **Astrophysical Journal** (arXiv:1508.04473).
- [11] **Precision Cosmology with Cosmic Voids**, *Pisani A.*, to appear in the **Proceedings of the Fourteenth Marcel Grossmann Meeting - MG14** held in Rome at Sapienza University .
- [12] **Answers from the void: VIDE and its applications**, *Sutter, P. M., Hamaus N., Pisani A., Lavaux G., and Wandelt, B.*, published in the **Proceedings of the IAU Symposium 308** "The Zeldovich Universe, Genesis and Growth of the Cosmic Web" (arXiv: 1409.6996).
- [13] **Real-space density profile reconstruction of stacked voids**, *Pisani A., Sutter, P. M., Lavaux G., and Wandelt, B.*, published in the **Proceedings of the IAU Symposium 308** "The Zeldovich Universe, Genesis and Growth of the Cosmic Web".
- [14] **VIDE: The Void IDentification and Examination toolkit**, *Sutter, P. M., Lavaux G., Hamaus N., Pisani A., Wandelt B. D. et al.*, published in **Astronomy & Computing** (Elsevier, 2015, 9, 1-9; arXiv: 1406.1191).

- [15] **A measurement of the Alcock-Paczynski test using cosmic voids in the SDSS**, *Sutter, P., Pisani, A., Wandelt, B. D. and Weinberg D.H.*, published in the **Monthly Notices of the Royal Astronomical Society** (MNRAS, Volume 443, Issue 4, p. 2983—2990; arXiv:1404.5618).
- [16] **Cosmology: from theory to data, from data to theory**, *Leclercq F., Pisani A. and Wandelt, B.*, published in the **Proceedings of the International School of Physics “Enrico Fermi”** of the Italian Physical Society – SIF – Course CLXXXVI: “New Horizons for Observational Cosmology” (arXiv: 1403.1260).
- [17] **Voids in the SDSS DR9: observations, simulations, and the impact of the survey mask**, *Sutter, P. M., Lavaux, G., Wandelt, B. D., Weinberg D. H., Warren M. S. and Pisani, A.*, published in the **Monthly Notices of the Royal Astronomical Society** (MNRAS, Volume 442, Issue 4, p.3127-3137; arXiv: 1310.7155).
- [18] **The challenge of cosmic voids**, *Pisani A. and Wandelt, B.*, published in the **Proceedings of the International School of Physics “Enrico Fermi”** of the Italian Physical Society – SIF – Course CLXXXVI: “New Horizons for Observational Cosmology”.
- [19] **Real-space density profile reconstruction of stacked voids**, *Pisani A., Lavaux, G., Sutter, P. M., and Wandelt, B. D.*, published in the **Monthly Notices of the Royal Astronomical Society** (MNRAS, Volume 443, p. 3238-3250, October 2014a; arXiv:1306.3052).

Talks, lectures and participation to schools

- Oct. 2017 **Short talk during Bahcall lunch at IAS, Princeton, USA.** *Title: Cosmology with Cosmic Voids* Duration ~ 10min.
- July 2017 **Invited Lecture at the summer school France Excellence: “Physics for Both infinities”**, *Marseille, France.* *Title: Cosmology with Cosmic Voids* Duration ~ 1h.
- July 2017 **Invited Lecture at the Euclid summer School: “La science des futurs grands relevés cosmologiques”**, *Fréjus, France.* *Title: Les Vides Cosmiques* Duration ~ 1h.
- June 2017 **Invited Lecture at the OCEVU Summer Camp, Montpellier, France.** *Title: Observational Cosmology* Duration ~ 1h.
- June 2017 **Talk at Euclid Consortium Meeting GCSWG splinter, London, UK.** *Title: EuclidVoids Report.* Duration ~ 15min.
- May 2017 **Talk at the Euclid France Meeting 2017, Marseille, France.** *Title: Precision Cosmology with Cosmic Voids.* Duration ~ 15min.

- April 2017 **Invited Talk to Art students at LAM, Marseille, France.** Title: *La Cosmologie des Grandes Structures avec Euclid* Duration ~ 20 min.
- April 2017 **Invited Conference Talk "Grand Public", Marseille, France.** Title: *Les vides cosmiques* Duration ~ 50 min+50min questions.
- March 2017 **Seminar for Students, Marseille, France.** Title: *La Cosmologie avec les données BOSS et eBOSS* Duration ~ 15 min.
- March 2017 **Invited Seminar at LPC, Clermont-Ferrand, France.** Title: *Precision Cosmology with Cosmic Voids*. Duration ~ 1 h.
- Feb. 2017 **Talk at Euclid Voids day at Euclid GCSWG Meeting, Barcelona.** Title: *Coordinating the Euclid Voids group day* Duration ~ 1 h.
- Jan. 2017 **Talk at z-Surveys workshop at LAM, Marseille, France.** Title: *Cosmology with SDSS Voids*. Duration ~ 20 min.
- Dec. 2016 **Talk at "Euclid France meeting", Marseille, France.** Title: *Cosmology with Euclid Voids*. Duration ~ 15 min.
- Dec. 2016 **Selected for a talk at "Steering Committee OCEVU Labex" led by Saul Perlmutter, Marseille, France.** Title: *Cosmology with Cosmic Voids*. Duration ~ 15 min.
- Dec. 2016 **Talk at "eBOSS France meeting", Paris, France.** Title: *Cosmology with eBOSS Voids*. Duration ~ 15 min.
- Oct. 2016 **Talk at "Génération jeunes chercheuses", FWIS award ceremony** Duration ~ 7 min (TED-style talk).
- June 2016 **Talk at "OCEVU meeting 2016", Toulouse, France.** Title: *Cosmic voids from spectroscopic surveys*. Duration ~ 10 min.
- June 2016 **Talk at the Euclid Consortium Meeting 2016, splinter "New probes", Lisbona, Portugal.** Title: *Precision Cosmology with Euclid Cosmic Voids*. Duration ~ 30 min.
- May 2016 **Invited talk at "COSMO21: Statistical challenges in 21st Century Cosmology", Chania, Greece.** Title: *Precision Cosmology Cosmic Voids*. Duration ~ 15 min.
- Feb. 2016 **Talk and invited participation to "Statistics of Extrema in Large Scale Structure", Leiden, Netherlands.** Title: *Accurate Cosmological Constraints From Cosmic Voids*. Duration ~ 20 min.
- Oct. 2015 **Invited general seminar at LPSC, Grenoble, France.** Title: *Precision Cosmology with Cosmic Voids*. Duration ~ 1 h.
- July 2015 **Talk at the SDSS-IV Collaboration Meeting, Madrid (from July 20 to July 23 2015).** Title: *Cosmology Science Parallel Session, Precision Cosmology with Cosmic Voids*. Duration ~ 15 min.
- July 2015 **Two Talks at the Fourteenth Marcel Grossmann Meeting - MG14, Rome, Sapienza University (from July 12 to July 18 2015).** Title talk 1, in the Parallel session DE1: DARK ENERGY AND THE ACCELERATING UNIVERSE: "Constraining dark energy with cosmic voids". Duration ~ 15 min. Title talk 2, in the Parallel session DE3: LARGE SCALE STRUCTURE AND STATISTICS: "Precision cosmology with cosmic voids". Duration ~ 15 min.

- July 2015 **Selected for the *final panel discussion* of the “Drifting Through the Cosmic Web” conference (6 people selected among participants), Aix-en-Provence (July 10). Panel discussion directed by Ofer Lahav. Duration ~ 1h.**
- July 2015 **Talk at the “Drifting Through the Cosmic Web” conference, Aix-en-Provence (from July 6 to July 11 2015), France. Title: Precision Cosmology with Cosmic Voids. Duration ~ 20min.**
- June 2015 **Participation to the Euclid Consortium Meeting 2015, Lausanne (from June 8 to June 12), Switzerland.**
- June 2015 **Talk at COBESIX Meeting, Toulouse (from June 1st to June 2nd), France. Title: Working on CLASS. Duration ~ 30min.**
- May 2015 **Talk at OCEVU Workshop, Marseille, France. Title: Precision Cosmology with Cosmic Voids. Duration ~ 10min.**
- May 2015 **Talk at the Olympian Symposium, Tessaoniki, Greece (from May 18 to May 22). Title: Precision Cosmology with Cosmic Voids. Duration ~ 20min.**
- April 2015 **General seminar at CPPM, Marseille. Title: Precision Cosmology with Cosmic Voids. Duration ~ 1h.**
- March 2015 **Talk at the LabEx (Laboratoire d'Excellence) meeting OCEVU at CPPM, Marseille. Title: Nouvelles sondes pour contraindre la gravité modifiée. Duration ~ 30min.**
- Jan. 2015 **Talk at LAM (Laboratoire d'Astrophysique de Marseille), Marseille. Title: Precision cosmology with Cosmic Voids. Duration ~ 25min.**
- Dec. 2014 **Invited talk at CCAPP seminar (Center For Cosmology and AstroParticle Physics), The Ohio State University, Columbus, USA . Title: Cosmology with cosmic voids. Duration ~ 30min.**
- Dec. 2014 **Talk at the eBOSS (extended Baryon Oscillation Spectroscopic Survey) meeting, Cloudcroft, New Mexico, USA (from December 2 to December 5). Title: Machine Gun talk on Cosmic Voids. Duration ~ 5min.**
- Sept. 2014 **PhD defence at l'Institut d'Astrophysique de Paris, Paris. Title: Cosmology with Cosmic Voids. Duration ~ 50min + 1h30 of questions.**
- August 2014 **Invited talk at CCAPP conference, Ohio State University, Columbus, USA (from August 18 to August 20). Title: “Cosmic Voids in the Next Generation of Galaxy Surveys”. Duration ~ 10min.**
- June 2014 **Talk at the IAU (International Astronomical Union) Symposium 308, Tallin, Estonia (from June 23 to June 28). Title: “The Zeldovich Universe, Genesis and Growth of the Cosmic Web”. Duration ~ 15min.**
- Dec. 2013 **Talk at “The 27th Texas Symposium on Relativistic Astrophysics” organized by The University of Texas, Dallas, Texas (from December 8 to December 13). Title: “Real space density reconstruction of stacked voids”. Duration ~ 15min.**
- Dec. 2013 **Invited talk at CCAPP seminar (Center For Cosmology and AstroParticle Physics), The Ohio State University, Columbus, USA . Title: “Real space density reconstruction of stacked voids”. Duration ~ 30min.**

- Nov. 2013 **Talk at the Elbereth conference at IAP, Paris** (from November 25 to November 29). Title: *Conférence des étudiants en thèse d'Île-de-France*. Duration \sim 20min.
- Summer 2013 **Participation to the École de Physique des Houches: "Post-Planck Cosmology"**, Les Houches (from 8 July to August 2).
- July 2013 **Talk at "The International School of Physics Enrico Fermi" of the Italian Physical Society - SIF-Course CLXXXVI, Varenna, Italie** (from June 30 to July 6). Title: *"New Horizons for Observational Cosmology"*. Duration \sim 15min.

Refereeing activities

- 2016 – today **Referee for The Astrophysical Journal.**
- 2015 – today **Referee for the Monthly Notices of the Royal Astronomy Society.**

Teaching

- Spring 2017 **3h at Lycée Pagnol, Marseille**, Lecture subject: *Encouraging young students to science.*
- Spring 2017 **15h of Physics for Biology students**, Lecture subject: *Physics.*
- Spring 2017 **3 days (morning only), equivalent to 15h of lecturing at high school level**, Lecture subject: *Science.*
- Fall 2016 **15h teaching for Master P3TMA students (Physique Théorique et Mathématique, Physique des Particules et Astroparticules) of the Aix-Marseille University**, Subject: *Stern-Gerlach experiment.*
- Nov. 2016 **Lecture for Master P3TMA students (Physique Théorique et Mathématique, Physique des Particules et Astroparticules)**, Lecture subject: *Cosmology, Large scale structure.*
- Sept. 2016 **Lecture for students from Toulouse Art school**, *"Cosmology of Large scale Structures with Euclid"*.
- 2004–2012 **Teaching**, educational support to undergraduate students.

Science communication

- May. 2017 **Phone Interview for article**, published on **Science et vie Junior**: *"L'expansion de l'univers"*.

- Oct. 2016 **Phone Interview**, published on **20minutes**: “Alice Pisani, à la recherche du côté obscur de l’univers”.
- Oct. 2016 **Phone Interview**, published on **La Provence**.
- Oct. 2016 **TV Interview**, appeared on **France 2** during the local news.
- Sept. 2016 **Press release about recent work**, appeared on the **INSU** site (<http://www.insu.cnrs.fr/node/5974>).
- Oct. 2015 **Synopsis article about recent work**, “Valuable Voids”, *APS Physics Synopsis*, October 2015 issue, link: <https://physics.aps.org/synopsis-for/10.1103/PhysRevD.92.083531>.
- April 2015 **Non technical article about recent work**, “Looking into the voids could help explain dark energy” *New Scientist*, Magazine issue 3016, link: <https://www.newscientist.com/article/mg22630164-600-looking-into-the-voids-could-help-explain-dark-energy/>.
- August 2014 **COSI public event “What’s the biggest thing in the universe?”**, *Columbus Science Museum, Ohio, USA*, explain to the youngest the large scale structure of the universe, responsible for the children section and help with the general organisation.

Seminar organization

- May 2017 **Organizer of the eBOSS-DESI France meeting 2017**, member of the organizing committee and chair of the voids-lensing session.
- Feb. 2017 **Organizer of the EuclidVoids Day in Barcelona**, one-day workshop for the EuclidVoids group.
- 2016 – 2018 **Organizer of the Euclid summer school**, member of the organizing committee of the summer school “La science des futurs grands relevés cosmologiques”, one school per year.
- March 2015 **Poster preparation**, *Marseille, CPPM*, participation to the group for poster creation aiming to explain the large scale structures of the universe for science communication.
- March 2015 **Organizer of the OCEVU meeting “Beyond six Parameters”**, *Marseille, (CPPM)*, organize the meeting and chairperson (~ 30 participants).

Computational skills

Programming PYTHON; C; Gnuplot; IDL (Interactive Data Language); Fortran 77, 90/95; Mathematica; \LaTeX , html

Operating Systems Mac OS X, Linux, Microsoft Windows
Cosmology Tools CAMB, CMBFast, CosmoMC, VIDE (based on ZOBOV).

Languages

Italian **mother tongue**
English **fluent** (speaking and writing)
French **as mother tongue** (speaking and writing)
Spanish **fluent** (speaking and writing)

References

- [1] Professor **David N. Spergel** (*PostDoc supervisor*) – email: dns@astro@princeton.edu
Department of Astrophysical Sciences, Princeton University
Director of the Center for Computational Astrophysics at the Flatiron Institute
Co-chair of the WFIRST science team
- [2] Professor **Benjamin Wandelt** (*Ph.D. advisor*) – email: wandelt@iap.fr
International Chair of Theoretical Cosmology
Institut d'Astrophysique de Paris (IAP)
Director of the Lagrange Institute (ILP)
Universite Pierre et Marie Curie / Paris 6 (Sorbonne University)
- [3] Professor **Joseph Silk** (*Internship supervisor*) – email: silk@iap.fr
Institut d'Astrophysique de Paris (IAP)
Universite Pierre et Marie Curie / Paris 6 (Sorbonne University)
- [4] Doctor **Stéphanie Escoffier** (*PostDoc supervisor*) – email: escoffier@cppm.in2p3.fr
CNRS (Centre National de la Recherche Scientifique)
CPPM (Centre de Physique des Particules de Marseille)
- [5] Professor **Alessandro Melchiorri** (*Master and bachelor supervisor*) – email: alessandro.melchiorri@gmail.com
University of Rome "Sapienza"

Other interests

Sports: running (frequently) – best half-marathon time: 1h53min40s (RunInMarseille), swimming (professional swimmer – until 2005), trekking, skating, ski (good level).

Reading: classical and modern literature.

Cooking: italian, french and argentinian.

Family: last but not least, my (warning: biased opinion!) wonderful daughter.