

# Vincenzo Salzano

POSTDOCTORAL RESEARCHER

University of Szczecin, Institute of Physics - Wielkopolska 15, 70-451 Szczecin (Poland)

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## Personal Information

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**Date of Birth** June 26th, 1981  
**Place of Birth** Sant'Arzenio (Salerno)  
**Nationality** Italian  
**Marital status** Married; one son  
**Home address** Ul. Sebastiana Klonowica 22/12, 71-247, Szczecin (Poland)

## Professional Experience

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### Institute of Physics - University of Szczecin

*Szczecin, Poland*

POSTDOCTORAL RESEARCHER

*Sep. 2014 - present*

- Research areas (keywords): Cosmology – Alternative Theories of Gravity - Variation of Fundamental Constants - Dark Energy – Cosmological Data Analysis – Large Scale Structure

### University of the Basque Country (UPV/EHU)

*Bilbao, Spain*

POSTDOCTORAL RESEARCHER

*Feb. 2010 - Aug. 2014*

- Research areas (keywords): Cosmology – Dark Energy – Cosmological Data Analysis – Alternative Theories of Gravity – Dark Matter – Large Scale Structure

### Institute of Theoretical Astrophysics - University of Oslo

*Oslo, Norway*

POSTDOCTORAL RESEARCHER

*Sept. 2009 - Jan. 2010*

- YGGDRASIL – Young Guest and Doctoral Researchers' Annual Scholarships for Investigation and Learning – fellowship from the Research Council of Norway
- Title project: “Testing  $f(R)$  gravity on galactic scale and on growth of cosmological perturbations” – Supervisor: Prof. David Fonseca Mota

## Education

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### University of Naples

*Naples, Italy*

PH.D. IN FUNDAMENTAL AND APPLIED PHYSICS

*Nov. 2005 - Dec. 2008*

- Title: “Constraining Extended Theories of Gravity by Large Scale Structure and Cosmography” – Supervisor: Prof. Salvatore Capozziello

### University of Salerno

*Salerno, Italy*

MASTER DEGREE IN PHYSICS

*Oct. 1999 - May 2005*

- Final Mark: 110/110 cum laude – Title: “Evolution of hot stellar systems through the use of the fundamental plane of galaxies” – Supervisor: Prof. Salvatore Capozziello

## Participation in Research Projects

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### PRESENT/ON-GOING

#### COST Action “CANTATA”

*EU*

CORE MEMBER

*Apr. 2016 - PRESENT*

- “CANTATA” (Cosmology and Astrophysics Network for Theoretical Advances and Training Actions)
- [http://www.cost.eu/COST\\_Actions/ca/CA15117?](http://www.cost.eu/COST_Actions/ca/CA15117?)
- Co-leader of the Working Group “Observational discriminators”: to coordinate the scientific work from network participants; to organize workshops and meetings (internal and external); in charge spokesperson for disseminating results from the Working Group on behalf of Action's Core committee.

#### JPAS-PAU Survey

*Spain/Brasil*

EXTERNAL MEMBER

*Apr. 2016 - PRESENT*

- JPAS: Javalambre Physics of the Accelerating Universe Astrophysical Survey
- <http://www.j-pas.org/>
- Member of the Theoretical Cosmology and Fundamental Physics Group: focus on cosmological constraints from future galaxy surveys.

PAST/ENDED

## EPI (Exploring the Physics of Inflation)

Spain

MEMBER

Jun. 2012 - Sept. 2014

- Consolider Project, <http://www.epi-consolider.es/>
- Simulating future CMB-oriented telescope configurations and their constraints on inflationary parameters (scalar index and tensor-to-scalar amplitude ratio.)

## List of Publications

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PUBLISHED

**“Cosmological future singularities in interacting dark energy models”** 26

BELTRAN JIMENEZ, J., RUBIERA-GARCIA, D., SAEZ-GOMEZ, D., **SALZANO, V.**, ACCEPTED FOR PUBLICATION ON PHYS. REV. D

**“Observational constraints on cosmological future singularities”** 25

BELTRAN JIMENEZ, J., LAZKOZ, R., SAEZ-GOMEZ, D., **SALZANO, V.**, EUR.PHYS.J. C76 (2016) NO.11, 631

**“No need of dark matter in clusters of galaxies within Galileon theory”** 24

**SALZANO, V.**, MOTA, D., DABROWSKI, M., CAPOZZIELLO, S., JCAP 10 (2016) 033

**“Probing the constancy of the speed of light with future galaxy survey: the case of SKA and Euclid”** 23

**SALZANO, V.**, DABROWSKI, M., LAZKOZ, R., PHYS. REV. D 93 (2016) 063521

**“Cosmological constraints on fast transition Unified Dark Energy and Dark Matter models”** 22

LAZKOZ, R., LEANIZBARRUTIA, I., **SALZANO, V.**, PHYS. REV. D 93 (2016) 043537

**“Beyond  $\Lambda$ CDM: Problems, solutions, and the road ahead”** 21

BULL, P., ET AL. (ALPHABETICAL ORDER), PHYSICS OF THE DARK UNIVERSE 12 (2016) 56-99

**“Varying constants entropic- $\Lambda$ CDM cosmology”** 20

DABROWSKI, M., GOHAR, H., **SALZANO, V.**, ENTROPY 18(2) (2016) 60

**“Measuring the speed of light with Baryon Acoustic Oscillations”** 19

**SALZANO, V.**, DABROWSKI, M., LAZKOZ, R., PHYS. REV. LETT. 114 (2015) 101304

**“Anisotropic expansion and SNIa: an open issue”** 18

BELTRAN JIMENEZ, J., **SALZANO, V.**, LAZKOZ, R., PHYSICS LETTERS B 741 (2015) 168-177

**“Observational constraints on the unified dark matter and dark energy model based on the quark bag model”** 17

MONTIEL, A., **SALZANO, V.**, LAZKOZ, R., PHYSICS LETTERS B 733 (2014) 209-216

**“Parameter estimation of a nonlinear magnetic universe from observations”** 16

MONTIEL, A., BRETON, N., **SALZANO, V.**, GEN. REL. GRAV. 46 (2014) 1758

- “Non-parametric reconstruction of the cosmic expansion with LOESS+SIMEX”** 15  
MONTIEL, A., LAZKOZ, R., SENDRA, I., ESCAMILLA-RIVERA, C., **SALZANO, V.**, PHYS. REV. D 89 (2014) 043007
- “Unifying static analysis of gravitational structures with a scale-dependent scalar field gravity”** 14  
MOTA, D. F., **SALZANO, V.**, CAPOZZIELLO, S., NAPOLITANO, N. N., ASTRONOMY & ASTROPHYSICS 561 (2014) A131
- “Linear dark energy equation of state revealed by supernovae?”** 13  
**SALZANO, V.**, WANG, Y., SENDRA, I., LAZKOZ, R., MOD. PHYS. LETT. A, VOL. 29, NO. 2 (2014) 1450008
- “BAO Cosmography”** 12  
LAZKOZ, R., ALCANIZ, J., ESCAMILLA-RIVERA, C., **SALZANO, V.**, SENDRA, I., JCAP 12 (2013) 005
- “Improving dark energy constraints with high redshift type Ia supernovae from CANDELS and CLASH”** 11  
**SALZANO, V.**, RODNEY, S., SENDRA, I., LAZKOZ, R., RIESS, A., POSTMAN, M., BROADHURST, T., COE, D., ASTRONOMY & ASTROPHYSICS 557 (2013) A64
- “First cosmological constraints on the Super Fluid Chaplygin gas model”** 10  
LAZKOZ, R., MONTIEL, A., **SALZANO, V.**, PHYS. REV. D 86 (2012) 103535
- “Revisiting a model-independent reconstruction method of dark energy”** 9  
LAZKOZ, R., **SALZANO, V.**, SENDRA, I., THE EUROPEAN PHYSICAL JOURNAL C 72 (2012) 2130
- “Comprehensive cosmographic analysis by Markov Chain Method”** 8  
CAPOZZIELLO, S., LAZKOZ, R., **SALZANO, V.**, PHYS. REV. D 84 (2011) 124061
- “Tension between SN and BAO: current status and future forecasts”** 7  
ESCAMILLA-RIVERA, C., LAZKOZ, R., **SALZANO, V.**, SENDRA, I., JCAP 09 (2011) 003
- “Testing feasibility of scalar-tensor gravity by scale dependent mass and coupling to matter”** 6  
MOTA, D. F., **SALZANO, V.**, CAPOZZIELLO, S., PHYS. REV. D 83 (2011) 084308
- “Oscillations in the dark energy EoS: new MCMC lessons”** 5  
LAZKOZ, R., **SALZANO, V.**, SENDRA, I., PHYS. LETT. B 694 (2010) 198
- “The global mass - to - light ratio of SLACS lenses”** 4  
CARDONE, V. F., TORTORA, C., MOLINARO, R., **SALZANO, V.**, ASTRONOMY & ASTROPHYSICS 504 (2009) 769
- “Cosmography and large scale structure by  $f(R)$  gravity: new results”** 3  
CAPOZZIELLO, S., **SALZANO, V.**, INVITED REVIEW FOR ADVANCES IN ASTRONOMY’S SPECIAL ISSUE “DARK SIDES OF OUR UNIVERSE” (2009)

- “Modelling clusters of galaxies by  $f(R)$ -gravity”** 2  
CAPOZZIELLO, S., DE FILIPPIS, E., **SALZANO, V.**, MNRAS 94 (2009) 947
- “Cosmography of  $f(R)$  gravity”** 1  
CAPOZZIELLO, S., CARDONE, V. F., **SALZANO, V.**, PHYS. REV. D 78 (2008) 063504
- CONFERENCE PROCEEDINGS**
- “New tests of variability of the speed of light”** 2  
DABROWSKI, M. P., **SALZANO, V.**, BALCERZAK, A., AND LAZKOZ, R. , EPJ WEB OF CONFERENCES 126, 04012 (2016)
- “Cosmological constrains on fast transition Unified Dark Matter models”** 1  
LAZKOZ, R., LEANIZBARRUTIA, I., AND **SALZANO, V.**, J. PHYS. CONF. SER. 600 (2015) 012028
- UNDER REVIEW**
- “Statistical hierarchy of varying speed of light cosmologies”** 4  
**SALZANO, V.**, DABROWSKI, M.
- “Breaking the Vainshtein screening in clusters of galaxies”** 3  
**SALZANO, V.**, MOTA, D., CAPOZZIELLO, S.
- “Modelling spatial variations of the speed of light”** 2  
BALCERZAK, A., DABROWSKI, M., **SALZANO, V.**
- “Recovering a redshift-extended VSL signal from galaxy surveys”** 1  
**SALZANO, V.**
- IN PREPARATION**
- “Constraints on future singularities with growth factor from future galaxy surveys”** 2  
DENKIEWICZ, T., **SALZANO, V.**
- “Analysing a forecast cosmological redshift drift”** 1  
LAZKOZ, R., LEANIZBARRUTIA, I., **SALZANO, V.**

## Teaching and Thesis Supervision

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### TEACHING

- 04/2014 **“Introduction to galaxy morphology, kinematics and dynamics and Introduction to Theoretical and Observational Cosmology”** 1 week (4 hours) lecture for the “Astrophysics” course of the 4th year Physics Master *UPV/EHU, Spain*
- 07/2013 **“Summer Scientific Campus Programm 2013”** 25 hours for the “Programa Campus científicos de verano 2013” by the “Ministerio de Educacion, Cultura y Deporte” of Spain and the “Fundacion Espanola para la Ciencia y la Tecnologia (FECYT)” *UPV/EHU, Spain*
- 04/2012 **“Introduction to Cosmology”** 2 weeks (8 hours) lecture for the “Gravitation and Cosmology” course of the 4th year Physics Master *UPV/EHU, Spain*
- 04/2012 **“Introduction to Gravitational Lensing”** 2 hours lecture for the “Physics Topics” course of the 4th year Physics Master *UPV/EHU, Spain*

### THESIS SUPERVISED

- 2016 - **Ph.D. Thesis co-direction - candidate: Maria Ortiz Banos** Title: TBD - Topic: present alternative theories of gravity – cosmological analysis/tests *UPV/EHU, Spain*
- 2014 - **Ph.D. Thesis co-direction - candidate: Iker Leanizbarrutia** Title: TBD - Topic: present cosmological analysis/tests – dark energy phenomenology *UPV/EHU, Spain*
- 10/2010 - **End of Course Thesis - candidate: Unai Alvarez Rodriguez** Title: “Discovering Dark Energy: history and results” (“El descubrimiento de la energia oscura: historia y resultados”) *UPV/EHU, Spain*

## Seminars; Participation in Conferences, Meetings and Schools

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### SEMINARS AND CONFERENCES

- 09/2016 **VarCosmoFun16 - Varying Constants and Fundamental Cosmology** at University of Szczecin. Member of the Local Organizing Committee and guest editor for the proceedings. Contributed Talk: “Recovering a redshift-extended VSL signal from future galaxy surveys” *Szczecin, Poland*
- 09/2015 **COSMO15 - 19th International Conference on Particle Physics and Cosmology** at University of Warsaw. Contributed Talk: “Measuring the speed of light with Baryon Acoustic Oscillations” *Warsaw, Poland*
- 01/2015 **Beyond LCDM conference** at University of Oslo. Invited co-chair of parallel session: “DE model selection and parametrisations: What do we expect to learn about DE from forthcoming data?” *Oslo, Norway*
- 12/2014 **Institute of Physics Seminars** at University of Warsaw. Invited seminar: “Alternative Chameleon-inspired gravity: a phenomenological and observational approach” *Warsaw, Poland*
- 06/2014 **Meeting on Fundamental Cosmology** organized by the Institute of Astrophysics of Canaries *Fuerteventura, Spain*
- 06/2013 **EPI conference 2013** at IFCA Santander. Contributed talk: “Constraints on inflationary models with Planck+Quijote” *Santander, Spain*
- 04/2013 **IberiCos 2013 – VIII Iberian Cosmology Meeting** at University of Granada *Granada, Spain*
- 12/2012 **2nd EPI/QUIJOTE Meeting** at IFCA Santander *Santander, Spain*
- 07/2011 **3rd J-PAS-PAU-BRASIL Meeting** at National Observatory of Rio de Janeiro *Rio de Janeiro, Brazil*
- 04/2011 **IberiCos 2011 – VI Iberian Cosmology Meeting** at University of Salamanca *Salamanca, Spain*
- 12/2010 **2nd J-PAS-PAU-BRASIL Meeting** at University of Granada *Granada, Spain*
- 10/2008 **VIII National Congress - INFN - Iniziativa Specifica NA12** at University of Salerno. Contributed talk: “Cosmography of  $f(R)$  gravity” *Salerno, Italy*

## SCHOOLS

- 12/2006 **International INAF CosmoCT School on Gravitational Lensing, general theory, weak and strong lensing** at INAF-Catania Astrophysical Observatory and Department of Physics and Astronomy – University of Catania *Catania, Italy*
- 10/2006 **National School of Astrophysics – Cycle VIII – Course IV: “Galaxy Cluster/Astrophysical Plasmas”** at Department of Astronomy – University of Trieste *Trieste, Italy*
- 05/2006 **National School of Astrophysics – Cycle VIII – Course III: “Dynamics of Galaxies / Active Galactic Nuclei”** at Department of Astronomy – University of Bologna *Bologna, Italy*

## Skills

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- Languages** Italian (mother tongue); English (good writing, speaking and reading); Spanish (good writing, speaking and reading)
- Programming** Wolfram Mathematica; Increasing knowledge of CAMB - CosmoMC; Fortran
- OS** Microsoft™ operating systems, Linux/Ubuntu
- Office** T<sub>E</sub>X, L<sup>A</sup>T<sub>E</sub>X, Microsoft Office™, Open Office

## Other

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### REFeree ACTIVITY

Referee for Physical Review Letters; Physical Review D; Physics Letter B; The Astronomical Journal; The European Physics Journal C; General Relativity and Gravitation

### INTERESTS

I enjoy playing piano (I achieved a piano diploma in 2000); listening and studying classical music scores and modern minimal electronic music; watching sci-fi cinema, scientific documentaries and reading (last read books: “Godel, Escher, Bach: an Eternal Golden Braid” by Douglas R. Hofstadter and “A song of ice and fire” by George R.R. Martin).

## References

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### **Prof. Salvatore Capozziello (Ph.D. supervisor and long-term collaborator)**

*capozzie@na.infn.it*

FULL PROFESSOR AT DEPT. OF PHYSICAL SCIENCES, UNIVERSITY OF NAPLES “FEDERICO II”  
Via Vicinale Cupa Cinthia, I - 80126 Naples, Italy; Phone: +39 081 676496

### **Prof. David Fonseca Mota (long-term collaborator)**

*D.F.mota@astro.uio.no*

FULL PROFESSOR AT INSTITUTE OF THEORETICAL ASTROPHYSICS, UNIVERSITY OF OSLO  
0315, Oslo, Norway; Phone: +47 22 85 75 81

### **Prof. Ruth Lazkoz Saez (main long-term collaborator and past employer)**

*ruth.lazkoz@ehu.eus*

ASSOCIATE PROFESSOR AT DEPT. OF THEORETICAL PHYSICS AND HISTORY OF SCIENCE,  
UNIVERSITY OF THE BASQUE COUNTRY (UPV/EHU)  
Barrio Sarriena S/N, 48080 Leioa, Spain; Phone: +34 96 601 2588

### **Prof. Mariusz P. Dabrowski (current employer)**

*mpdabfz@wmf.univ.szczecin.pl*

FULL PROFESSOR AT INSTITUTE OF PHYSICS, UNIVERSITY OF SZCZECIN  
ul. Wielkopolska 15, 70-451; Phone: +48 91 444 1248