

Education

2011-2014 PhD in physics, University of Camerino, Italy.

First class *with excellency* | Major: Nanophysics

Thesis: "Synthesis and characterization of novel nanostructures based on Si and Ge."

Advisor: Prof. Nicola Pinto.

2007-2009 M. Sc. in Physics, University of Pune, India.

Grade B *First class*.

Thesis: "Synthesis and characterization of the metal nanoparticles for model catalyst."

Advisor: Prof. S. D Sartale.

2000-2004 B. Sc. in atomic Physics, Azad University of Tehran, Iran.

Work Experience

+ July 2018-present Research fellow at National Frascati Laboratory, INFN.

+ Dec 2016-July 2018 PostDoc fellow (TRIL Fellow) at Institute of material science, CNR, Elettra, Italy.

+ Dec 2014-Dec 2016 PostDoc fellow in European project SIRBATT, University of Camerino, Camerino, Italy.

+ Jun-Dec 2014 Research assistant at University of Camerino, INRiM Torino, Italy.

+ Jun 2011-Jun 2014 PhD student at University of Camerino, Camerino, Italy.

+ 2010-2011 Visiting researcher at National Central University, Taiwan.

+ 2005-2007 Research assistant at University of Pune, India.

Teaching Experience

+ Mar 2012- Jul 2014 Teaching assistant at University of Camerino, Camerino, Italy.

Course: General physics.

+ July 2013 TFA Professor at University of Camerino, Camerino, Italy.

Course: Sensors and Data acquisition laboratory.

Awards and Recognitions

+ 2018 Post-Doc Fellowship Grant, National Frascati Laboratory, Italy.

+ 2016 TRIL fellowship Grant, International institute of theoretical physics (ICTP), Italy.

+ 2014 Post-Doc fellowship Grant, SIRBATT, University of Camerino, Italy.

+ 2014 Borsa di studio, Regional project FAR, Regione Marche, University of Camerino, Italy.

+ 2011 PhD scholarship, University of Camerino, Italy.

+ 2010 Visiting researcher grant, National central university, Taiwan.

+ 2009 M.R. Bhide Award, Raman memorial conference, India.

Conferences and Presentations

Talks.

+ 2018 High Precision X-ray Measurements, Rome, Italy.

A novel approach to a non-destructive depth profiling using soft x-ray spectroscopies

Contributed talk.

+ 2018 SuperFluctuations, San Benedetto, Italy.

A novel approach to low dimensional superconducting Nb film properties and their potential applications

Invited Speaker.

+ 2018 Seminar at University of Camerino, Italy.

Advances in functional nanomaterials

Invited Speaker.

+ 2017 SILS workshop, Trieste, Italy.

Reversible interface formed on metal alloy oxide nanoparticles via lithiation.

Contributed talk.

+ 2016 SILS workshop, Bari, Italy.

SEI dynamics in metal alloying anodes by soft x-ray absorption and photoemission spectroscopy.

Contributed talk.

+ 2016 SIRBATT semester meeting, Warsaw, Poland.

Progress in understanding of solid electrolyte inter-phase.

Invited speaker on behalf of Prof. A. DiCicco.

+ 2016 Ultrathinsuper conference, University of Camerino, Camerino, Italy.

Structurally induced density of states in porous Si nanowires.

Invited Speaker.

+ 2015 Understanding Lithium Battery Interfaces, Bilbao, Spain.

Structural evolution of SEI in ZFO and graphite electrodes.

Invited Speaker.

+ 2014 Functional and advanced materials FNMA16 workshop, Camerino, Italy.

Temperature dependence of diffusion induced Ge nanowire grown by MBE

Contributed talk.

+ 2014 Nanosea 2014, Marseilles, France.

Effect of deposition parameters on Diffusion Induced Germanium Nanowires by MBE.

Contributed talk.

+ 2012 Nanosea 2012, Sardinia, Italy.

Growth of diluted magnetic germanium nanowires using manganese nano-droplets

Contributed talk.

+ 2010 Raman memorial conference, BARC, Vadora, India.

Study on TiO₂ thin films prepared by thermal oxidation of dc magnetron sputtered Ti thin films

Contributed talk.

Poster presentation.

+ 2018 Quantum Complex Matters, Rome, Italy.

Substrate induced proximity effect in superconducting niobium nanofilms.

Poster presentation.

+ 2018 International Conference on Multi-Condensate Superconductivity and Superfluidity in Solids and Ultra-cold Gases, Trieste, Italy.

Dimensional crossover and incipient quantum size effects in superconducting niobium nanofilms.

Poster presentation.

+ 2017 ECOS 2017, Szeged, Hungary.

Reversible interface formed on metal alloy oxide nanoparticles via lithiation.

Poster presentation.

+ 2015 SILS 2015 Workshop, Trento, Italy.

SEI formation in Li-ion electrodes probed by As K-edge X-ray absorption spectroscopy.

Poster presentation.

+ 2015 8th conference in advanced batteries for automotive applications, Bilbao, Spain.

Probing the evolution of the SEI in Li-ion cells by As K-edge X-ray absorption spectroscopy.

Poster presentation.

+ 2014 Multi-Condensate Superconductivity and Superfluidity in Solids and Ultra-cold Gases, Camerino, Italy.

Control and enhancement of superconductivity by engineering materials at the nanoscale.

Poster presentation.

+ 2013 Scientific Day of university of Camerino, Italy.

Sub 100 nm Si nanowires by colloidal lithography and metal assisted chemical etching.

Poster presentation.

+ 2012 Scientific Day of university of Camerino, Italy.

Germanium nanowires grown by molecular beam epitaxy.

Poster presentation.

+ 2009 International workshop on advanced functional materials, National chemical lab, India.

Poster presentation.

+ 2009 54th Symposium of solid state physics, BARC, Vadodara, India.

Fabrication and characterization of TiO₂/P-Si heterojunction by thermal oxidation of sputtered Ti films.

Poster presentation.

Attendance.....

- + 2017 Time resolved photoelectrons spectroscopy, NFFA, Area science park, Trieste, Italy.
- + 2016 EUSpec Training School on Multiple Scattering Codes, Rene, France.
- + 2013 International school on simulation of nanomaterials, ICCMNM, Frankfurt Institute for advanced studies, Germany.
- + 2013 Workshop on Semiconductor detectors for medical applications, INFN, Florence, Italy.
- + 2013 International conference on radiation effect on semiconductor detector and devices, INFN, Florence, Italy.

Technical skills and Competences

- + Ultra High Vacuum system operation, preparation and maintenance.
- + Molecular Beam Epitaxy. Endotaxial nanowire fabrication. VLS nanowire fabrication.
- + DC/RF magnetron sputtering systems.
- + Thermal evaporation deposition.
- + Electroless nano-fabrication
- + CBD nano-fabrication.
- + Electron beam deposition.
- + Low dimension semiconductor systems (2D,1D) fabrication and electrical measurement.
- + Low temperature electrical measurements.
- + Nanolithography.
- + Electron beam lithography
- + Optical lithography.
- + X-Ray spectroscopy such as XPS, XRD.
- + Hard/Soft X-Ray absorption spectroscopy (@ Synchrotron).
- + Scanning Electron Microscopy.
- + Raman and UV-Vis Spectroscopy.
- + Atomic Force Microscopy.
- + Electrochemical, Metal assisted and patterned etching of the semiconductors.

Professional Activities

- + Member of scientific group of BEAR beam line (Elettra).
- + Member of Italian synchrotron radiation society (SILS).
- + Referee of Journal of Crystal Growth, Elsevier.
- + Referee of Journal of Nanoresearch letters, Springer.
- + Referee of Journal of Physics D, Applied Physics, IOP.
- + Referee of Journal of Advanced surface science, Elsevier.
- + Referee of Journal of Radiation Physics and Chemistry, Sciencedirect.

Affiliations

- + Istituto Officina dei Materiali (IOM), Italian National Research Council (CNR), Trieste, Italy.
- + International institute of theoretical physics, Trieste, Italy.
- + National Laboratory of Frascati, INFN, Frascati, Italy.
- + Istituto nazionale di Ricerca metrologica (INRiM), Torino, Italy.

Computer Skills

- + Windows, Linux.
- + Programming in C++, NI-Labview, Python.
- + Mathematica, Matlab.
- + Latex, MS Office.
- + ANSYS HFSS, COMSOL.
- + AutoCAD.
- + GNXAS, ATHENA.

Languages

- + Italian:Fair
- + English:Fluent.

- + French: Basic Knowledge.
- + Persian: Native.

List of Publications

+ Structural Evolution of MoO₃ Thin Films Deposited on Copper Substrates upon Annealing: An X-ray Absorption Spectroscopy Study. Salvatore Macis, S.J. Rezvani, Ivan Davoli, Giannantonio Cibin, Bruno Spataro, Jessica Scifo, Luigi Faillace, Augusto Marcelli.

Condensed Matter, 4, 2, 41 (2019)

+ The Potential of EuPRAXIA@ SPARCLAB for Radiation Based Techniques.

Antonella Balerna, Samanta Bartocci, Giovanni Batignani, Alessandro Cianchi, Enrica Chiadroni, Marcello Coreno, Antonio Cricenti, Sultan Dabagov, Andrea Di Cicco, Massimo Faiferri, Carino Ferrante, Massimo Ferrario, Giuseppe Fumero, Luca Giannessi, Roberto Gunnella, Juan José Leani, Stefano Lupi, Salvatore Macis, Rosa Manca, Augusto Marcelli, Claudio Masciovecchio, Marco Minicucci, Silvia Morante, Enrico Perfetto, Massimo Petrarca, Fabrizio Pusceddu, S.J. Rezvani, José Ignacio Robledo, Giancarlo Rossi, Héctor Jorge Sánchez, Tullio Scopigno, Gianluca Stefanucci, Francesco Stellato, Angela Trapananti, Fabio Villa.

Condensed Matter, 4, 1, 30 (2019)

+ Substrate-Induced Proximity Effect in Superconducting Niobium Nanofilms. S.J. Rezvani, Andrea Perali, Matteo Fretto, Natascia De Leo, Luca Flammia, Milorad Milošević, Stefano Nannarone, Nicola Pinto.

Condensed Matter, 4, 1, 4 (2018)

+ Coherent Excitation of X-Ray Fluorescence and Interference of Radiation at the Output of Polycapillary Structures.

Mikhail Izrailevich Mazuritskiy, Aleksandr Mikhailovich Lerer, A. Marcelli, Sultan Barazbievich Dabagov, M. Coreno, A. D'Elia, S.J. Rezvani.

JETP Letters, 107, 10 (2018)

+ Experimental Investigation of Photoemission from New Satellite Surface Materials.

Millan F. Diaz, John Bonnel, Stuart Bale, S.J. Rezvani, Angelo Giglia, S. Nannarone and Mike Gruntman.

Journal of Spacecraft and Rockets - AIAA ARC, 56, 1, 248 (2018)

+ Dimensional crossover and incipient quantum size effects in superconducting niobium nanofilms

N. Pinto, S.J. Rezvani, A. Perali, L. Flammia, C. Cassiago, N. De Leo, M. Fretto and V. Lacquaniti.

Scientific reports, 8, 4710 (2018)

+ A new XUV optical end-station to characterize compact and flexible photonic devices using synchrotron radiation.

Augusto Marcelli, Mikhail I. Mazuritskiy, Sultan B. Dabagov, Dariush Hampai, Alexander M. Lerer, Ekaterina A. Izotova, Alessandro D'Elia, Stefano Turchini, Nicola Zema, Fabio Zuccaro, Monica de Simone, S.J. Rezvani and Marcello Coreno.

Journal of Instrumentation, 13, C03035 (2018)

+ SEI dynamics in metal oxide conversion electrodes of Li ion batteries.

S.J. Rezvani, R. Gunnella, F. Nobili, S. Passerini, A. Mushtaq and A. Di Cicco.

Journal of physical chemistry C, 121(47), 26379 (2017).

+ Enhancement of interfacial stability of LiMn₂O₄ cathode by Al₂O₃ coating: electrochemical and spectroscopic characterization.

Marta Pasqualini; Silvia Calcaterra; Fabio Maroni; S. J. Rezvani; Andrea Di Cicco; Sam Alexander; Hanna Rajantie; Roberto Tossici; Francesco Nobili.

Electrochimica Acta, 258, 175-181 (2017).

+ Binder induced structural evolutions effect on Li ion battery performance

S. J. Rezvani, R. Gunnella, A. Witkowska, F. Nobili, M. Pasqualini, S. Passerini and A. Di Cicco.

Applied surface science, 435, 1029 (2017).

+ Is the Solid Electrolyte Interphase an extra-charge reservoir in Li-ion batteries?

S. J. Rezvani, R. Gunnella, A. Witkowska, F. Mueller, F. Nobili, M. Pasqualini, S. Passerini and A. Di Cicco.

ACS Applied materials and interfaces, 9, 45704576 (2017).

+ Development of non-fluorinated electrode based on Li₃V_{1.95}Ni_{0.05}(PO₄)₃/C with prolonged cycle life: A comparison among Na-Alginate, Na-carboxymethyl cellulose and poly (acrylic acid) binders

M. Secchiaroli, S. Calcaterra, H. Y. Tran, S. J. Rezvani, F. Nobili, R. Marassi, M. Wohlfahrt-Mehrensa and S. Dsokea.

Journal of The Electrochemical Society 164 (4), A672-A683 (2017).

+ Double-edge x-ray absorption study of $\text{LiFe}_{1-x}\text{Ni}_x\text{PO}_4$ cathode materials

Marco Minicucci, Lubna Tabassam, Riccardo Natali; Giorgio Mancini; S. J. Rezvani and Andrea Di Cicco.

Journal of materials science 52 (9), 4886-4893 (2017)

+ New Developments in HPGe Detectors for High Resolution Detection

D.R. Napoli, G. Maggioni, Sara Carturan, J. Eberth, V. Boldrini, Davide De Salvador, Enrico Napolitani, P. Cocconi, G. Della Mea, Michele Gelain, R. Gunnella, M.G. Grimaldi, M. Loriggiola, Gino Mariotto, Nicola Pinto, W. Raniero, S. J Rezvani, S. Riccetto, D. Rosso, F. Sgarbossa, S. Tati

Acta Physica Polonica Series B 48(3):387 (2017).

+ Electrical contacts on Silicon nanowires prepared by metal assisted etching: A comparative approach.

Luca D'Ortenzi, Rosalia Monsu, Eleonora Cara, Matteo Fretto, Seifeddine Kara, S. J. Rezvani, Luca Boarino.

Nanoscale Research Letters 11 (1), 468 (2016).

+ Effect of carrier tunnelling on the structure of metal assisted etched Si nanowires

S.J. Rezvani, N. Pinto, L. Boarino, F. Celegato, L. Croin, D. Antonioli, M. Fretto, P. Rizzi.

Nanotechnology, 27, 34 (2016).

+ Rapid formation of single crystalline Ge nanowires by anodic metal assisted etching

S. J. Rezvani, L. Boarino, N. Pinto.

CrystEngComm, 18, 7843 (2016).

+ Geometrically induced electron-electron interaction in semiconductor nanowires

N. Pinto, S. J. Rezvani, L. Favre, I. Berbezier, M. Fretto and L. Boarino.

Applied physics letter, 109 (2016).

+ Local structure and stability of SEI in graphite and ZFO electrodes probed by As K-edge absorption spectroscopy

S. J. Rezvani, M. Ciambezi, R. Gunnella, M. Minicucci, M. A. Munoz, F. Nobili, M. Pasqualini, S. Passerini, C. Schreiner,

A. Trapananti, A. Witkowska and A. Di Cicco.

J. Phys. Chem. C , 120, 42874295 (2016)..

+ Thermally activated tunneling in porous silicon nanowires with embedded Si quantum dots

S. J. Rezvani, N. Pinto, E. Enrico, L. D'Ortenzi, A. Chiodoni and L. Boarino.

Journal of Physics D, 49, 10 (2016).

+ Supersaturation state effect in diffusion induced Ge nanowires growth at high temperatures

S. J. Rezvani, L. Favre, F. Celegato, L. Boarino, Isabelle Berbezier and N. Pinto.

Journal of Crystal Growth, 436, 51-55 (2015).

+ Wet chemical treatments of high purity Ge crystals for -ray detectors:

Surface structure, passivation capabilities and air stability

S. Carturan, G. Maggioni, S.J. Rezvani, R. Gunnella, N. Pinto, M. Gelain, D.R. Napoli.

J. Material Chemistry and Physics, 16, 116-122 (2015).

+ Diffusion Induced effects on geometry of Ge nanowires by MBE

S. J. Rezvani, F. Celegato, L. Boarino, L. Favre, I. Berbezier, N. Pinto.

Nanoscale, 6, 7469-7473 (2014).

+ Influence of Ti film thickness and oxidation temperature on TiO_2 thin film formation via thermal oxidation of sputtered Ti film

S. D. Sartale, A.A. Ansari, S.J. Rezvani.

Science in Semiconductor Processing 16, 2005 (2013).

+ Study on TiO_2 thin films prepared by thermal oxidation of dc magnetron sputtered Ti thin films

S. J. Rezvani, A.A. Ansari, S.D. Sartale.

J. DAE Solid state physics , Vol 54, M02, 139 (2009).

+ Fabrication and characterization of $\text{TiO}_2/\text{P-Si}$ heterojunction by thermal oxidation of sputtered Ti films

A.A. Ansari, S. J. Rezvani, S.D. Sartale.

J. DAE Solid state physics, Vol 54, J40, 963 (2009).

Publications under review

+ Structure reordering in metal alloying oxide spinel structures upon lithium insertion S. J. Rezvani, Y. Mijiti, R. Gunnella, F. Nobili, M. Minicucci, M. Ciambezi, A. Trapananti and A. Di Cicco.

Journal of physics and chemistry of solids.

+ Optical properties of the 25 nm Si₃N₄ membranes fabricated by wet chemical etching by soft X-ray spectroscopy. S.J. Rezvani, A. Giglia, K. Koshmak, L. pasquali and S. Nannarone.

Applied optics

+ Initial lithiation of carbon-coated zinc ferrite anodes studied by in-situ X-ray absorption spectroscopy Matteo Ciambezi, Marco Minicucci, Stefano Passerini, Francesco Nobili, S. J. Rezvani, Andrea Di Cicco, Angela Trapananti, Roberto Gunnella, Dominic Bresser, Fabio Maroni.

Radiation Physics and Chemistry .

+ Magnetization of Cu-doped ZnO film structure modulated by Cu⁺/Cu²⁺ oxidation state occupancy: A possible mechanism for voltage control magnetism.

Muhammad Younas, Lok Ping Ho, Chi Xu, Mao Wang, Shengqiang Zhou, S. J. Rezvani, Rao Tahir Ali Khan, Muhammad Javed Akhtar, Muhammad Nadeem, Khaqan Shati, Waqar Azeem, Fahad Azad and Francis C. C. Ling

Journal of Materials Chemistry C.