

Curriculum Vitae of Simona Olga Binetti

Personal data

Name: Simona Olga Binetti
City of birth: Milano (Italy)
Date of birth: 03/07/1967
Married , 2 children
Nationality: Italian

Affiliation and Duties

- Associate Professor of Physical Chemistry; Department of Material Science University of Milano – Bicocca
- Dean of Chemistry Courses at University of Milano Bicocca;
- Director of the Milano–Bicocca Solar energy research center -MIBSOLAR
- Representative for UNIMIB in the steering committee of the Joint Program on photovoltaics of European Energy Research Alliance (EERA).

Formation/career

1991: Master Degree (Laurea) in Physics University of Milano (21 November 1991), Grade: 109/110
1994 Master in Material Science Grade: 70/70 cum laude
1998 Ph D in Chemistry Thesis title “ Photoluminescence emission in silicon
1999-2014 Assistant Professor at Science Faculty, Materials Science Department, University of Milano-Bicocca
2017 Qualified Full Professor in Physical Chemistry
November 2019 Visiting scientist at University of New South Wales UNSW Sidney (Australia)

Teaching at the University of Milano-Bicocca.

Since 2001, she has been teaching: Material Chemistry, Physical Chemistry III, Laboratory of Material Chemistry, Complement of Physical Chemistry, Physical Chemistry of Solid State and Surface, Materials and Devices for Energy.

Member of the council of the PhD program in Materials Science and Nanotechnology of the University of Milano-Bicocca, and Delegate of the Dean of the Science Faculty for relationship and activity with Secondary Schools.

She has been the advisor of 4 PhD students and 7 postdoctoral researchers and of more than 50 master thesis projects.

Research Interest

Her research activity has been mainly devoted to the experimental study of the effect of defects (point and extended ones) on electrical and optical properties of elementary semiconductor (Silicon) and

composed (Silicon Carbide, Silicon Germanium and alloy and Copper Indium Gallium Diselenide “CIGS” alloy and CZTS alloy). In this context she developed original research activities about the role of defects on the opto-electrical properties of silicon (multicrystalline and nanocrystalline thin film). As far as concerns growth processes, she is performing studies on the deposition of Copper Indium Gallium Diselenide “CIGS” films and CZTS for PV application on glass and flexible substrate. In this frame an international patent for a innovative deposition system hybrid between sputtering and evaporation was deposited. The aim of this research is the development of low-cost inorganic PV thin films solar cells for BIPV and PIPV. Moreover, in this same context, several deposition methods (e.g. sputtering, evaporation, chemical bath deposition, spin coating from solution system) are under investigation.

Her research group currently includes one associate professor in Physics, two post-doctoral fellows, and one PhD student plus some undergraduate students; the main current scientific interests of the group are materials and devices for inorganic photovoltaics

Funded projects and research contracts (as Principal investigator or Coordinator)

1. “Raw Material Ambassadors at schools 3.0 RM@schools3.0 ” EIT Raw Materials 2017-2019
1. “ RAISE ” EIT Raw Materials 2018-2020
2. National Project PLS Scienza dei materiali nell'ambito del PIANO Lauree scientifiche bandito dal Ministero della Istruzioni e della Ricerca DM 976/2014 art 3. National Coordinator 2019 -2020
3. Women in Engineering Academic Visitors Funding Scheme University of New South Wales UNSW Sidney AUSTRALIA , Luglio 2019 – dicembre 2019
4. Bando Fondo di Ateneo quota competitiva Università di Milano Bicocca “Taking n-type wafer to their ultimate limit” nell’ambito 2019-2021
5. National Project PON BEST4U Tecnologie per delle solari Bifacciali ad alta efficienza per utility scale PON Ricerca e Innovazione 2014-2020 UNIMIB unit 2019-2021
6. European Project FP7-ENERGY.2013.10.1.5 Integrated Research Programme in the field of Photovoltaics “Cost-reduction through material optimisation and Higher Energy output of solar photovoltaic modules - joining Europe’s Research and Development efforts in support of its PV industry “ CHEETACH” 2014-2017 (responsabile Unità Milano Bicocca)
7. Project of Italian Space Agency (ASI) project n° 2013-052 R.0 CUP F48C13000160005 "Caratterizzazione di silicio multicristallino cresciuto in condizioni di microgravità a partire da silicio metallurgico –SISSI 2014-2017 Responsabile Nazionale
8. Project of European Spatial Agency (ESA) project N° ESA AO-2009-LoI-0669 “Gravitational effects on heat and mass transport phenomena in directional solidification of upgraded metallurgical silicon for photovoltaic applications” SiSSI (Silicon-ISS Investigation) 2011-2015 (Responsabile Unità di Milano Bicocca)
9. Bando Fondo di Ateneo quota competitiva Università di Milano Bicocca “Fabrication of thin film solar cells by the ultrasonic spray deposition of kesterite colloidal dispersions in non toxic solvents” 2016-2018
10. National project “PLS scienza dei materiali nell'ambito del PIANO Lauree scientifiche 2014-2015 bandito dal Ministero della Istruzioni e della Ricerca DM 976/2014 art 3. RESPON-SABILE NAZIONALE (coordinamento di 9 Università italiane (Roma Tor Vergata, Torino, Piemonte Orientale, Genova; Cosenza; Bari; Padova, Napoli; Milano Bicocca). 2016-2018

11. European Project FP6 -2004 ENERGY-3 “Development of solar-grade silicon feedstock for crystalline wafers and cells by purification and crystallisation (FoXy) “ dal 2006 al 2009 (Leader del Workpackage “Material Characterization”)
12. International project n. 90 Finanziato da Ministero dello Sviluppo Economico (MISE), con Istituto Commercio Estero (ICE) e Conferenza dei Rettori (CRUI) MI-SE-ICE.CRUI “Aumento dell'efficienza delle celle solari mediante modifica dello spettro solare dal 2008 al 2011. Milano Bicocca Unit
13. Progetto “Lauree scientifiche di Scienza dei Materiali” Progetto del Ministero dell'Istruzione dell'Università, dal 2005 al 2013 (Responsabile Unità di Milano Bicocca)

Since 1990, she has been involved in many other European Renewable Energy Projects (Multi-Chess 1990-1993; Multi-Chess II 1993-1996; Cost Effective Solar Silicon Technology (COSST) 1996-1999 ; Fast in Line characterization tools for crystalline silicon material and cell process quality control in the PV industry (FAST-IQ) 2000-2003 ; N-type Solar Grade Silicon for Efficient p+n Solar Cells (NESSI) 2002-2005;INTAS (2002-2005) “NANOPHOTO“ (Nanocrystalline silicon films for photovoltaic and optoelectronic applications) (2005-2008), , SOLAR DESIGN (On the Fly alterable thin film solar modules for design driven applications) FP7-NMP SME 2012

Research contracts

1. Research contract with RSE spa (2020 -2022)
2. Research contract with RSE spa (from 2017 to 2019)
3. Research contract with ENEA (from 2015 to 2017)
4. Research contract with CESI spa (from 2015 to 2019)
5. Research contract with PILEGROWTH TECH s.r.l. (from 2013 to 2015)
6. Research contract with CESI spa (from 2012 to 2015)
7. Research contract with Tetra Pak Packaging Solutions AB Lund, (Svezia). (from 2011 to 2012)
8. Research contract with Tetra Pak Packaging Solutions S.p.A Modena, Italy (from 2009 to 2012)

Present international collaborations

- UNSW, Sydney, 2052, Australia, Prof. Ziv Hammerin, ARC Photovoltaic Centre of Excellence
- Tallinn University of Technology (Prof. Maarja Grossberg ; Department of Materials and Environmental Technologies (TALLIN –ESTONIA)
- Ecole polytechnique, PARIS (FRANCE) (Prof. Pere Roca , Laboratoire PICM)
- Energy research Centre of the Netherlands (ECN), Petten, The Netherlands, Dr. G. Coletti
- University of Science and Technology (NTNU), Department of Materials Science and Engineering, Trondheim, Norway, Prof.ssa Marisa di Sabatino
- Institute of Space and Astronautical Science/JAXA, Sagami-hara 252-5210, JAPAN , Prof. M. Tajima
- School of Engineering, The Australian National University, Canberra, ACT 0200, AUSTRALIA Prof. D. Macdonald
- International Solar Energy Research Center Konstanz (ISC), Konstanz, Germany, Dr. Radovan Kopecek and Dr. Joris Libal
- IMEC Belgium (Dr.Ivan Gordon)
- SINTEF Materials and Chemistry, Trondheim, Norway, Dr. Øvrelid Eivind

Referee for various international journals and different PhD theses across Europe in PV Field She has been evaluator of Evaluator and Project Reviewer for EUROPEAN RESEARCH COUNCIL AGENCY (ERC) for The Ministry of Science, Education and Sport of the Republic of Croatia; Project reviewer for Israel Science Foundation (ISF) , project reviewer for Italian Minister (MIUR) (2014) Grant SIR 2014.

Invited communications

International conferences

1. S.Binetti “Photoluminescence investigation of oxygen precipitates and dislocations” University of Freiberg, Institut fur Experimentelle Physik, 27 Novembre 2002, Freiberg (Germany)
2. S. Binetti “ Photoluminescence emissions of oxygen precipitates and dislocations in silicon”Forum on the Science and Technology of Silicon Materials 2003, 25 November 2003, Kanagawa (Japan)
3. S.Binetti “Nanocrystalline silicon films grown by Low Energy Plasma Enhanced Chemical Deposition for optoelectronic application “ Polyse 2004 International Conference on Polycrystalline Semiconductors 7 September 2004, University of Postdam (Germany)
4. S Binetti, “Dopants determination in compensated silicon: spectroscopic and electrical methods and issues” Workshop on Crystalline silicon solar cells, & modules: materials and processes 1-4 August, 2010 Breckenridge Colorado (USA)
5. S. Binetti Silicon based solar cells: research progress and future perspectives 7th IEEE International Conference of GFP 2010, 2 September 2010 Beijing (CHINA)
6. S. Binetti Increasing the efficiency of Si-based solar cell using rare earth organic complexes as down-shifters China Semiconductor Technology International Conference (CSTIC) SEMI-CHINA 2011 March 13-14, 2011 Shanghai,(CHINA)
7. S. Binetti “Research activities on PV materials at the MIB-SOLAR CENTER of University of Milano Bicocca” Dept of Materials Scienza and Engineering at the Norwegian University of Science and Technology (NTNU) , 28th June 2012 Trondheim (Norway)
8. S. Binetti “Key success factors and future perspective of silicon based solar cells” Sixth International Symposium on "Advanced Science and Technology of Silicon Materials" (JSPS Si Symposium) 19 november 2012, Kona, Hawaii (USA)
9. S. Binetti “Photoluminescence and infrared spectroscopy for defect identification in silicon for photovoltaic application” Fraunhofer Institute for Integrated Systems and Device Technology IISB, 20 febbraio 2014 Erlangen (Germany)
10. S. Binetti “Cu(In,Ga)Se₂ solar cells on flexible substrate fabricated by an innovative roll to roll hybrid sputtering and evaporation process CNR-CAS Joint workshop, IMEM-CNR (Aula Congressi), Parma, October 29, 2014
11. S. Binetti Research activities in @MIBSOLAR CENTER of University of Milano –Bicocca an overview SINTEF research center Oslo (Norway) 11 Marzo 2015
12. S. Binetti Inorganic Photovoltaic devices: from silicon to new hybrid tandem cells Energy Production , Storage and Conversion from Molecules to Devices at the Crossroads of Physical Chemistry 7- 12 June 2015 Otranto (Le)
13. S. Binetti CHEETAH Advanced Characterization for PV workshop taking place at January 2016 4th at Fraunhofer ISE in Freiburg, Germany
14. S. Binetti Workshop “CIGS development for thin film PV “ WORKSHOP: Novel customizable PVs, manufacturing processes and supportive actions for visionary architecture and product design” Wednesday 16th of December 2015, Università degli Studi di Milano-Bicocca

15. S. Binetti "Flexible solar cells" in "Dispersed generation & microgrids: the new backbone of electric system"- POWER-GEN Europe and Renewable Energy World Europe Milano, 21- 23 June e 2016
16. S. Binetti "Raw materials in solar cells: state of art and perspective "Ramses : advanced School on critical raw materials substitution for energetic and photonic Milano- 5-10 September 2016
17. S. Binetti "Defects and Impurities in Silicon for Solar Cell" The 7th International Symposium on Advanced Science and Technology of Silicon Materials (JSPS Si Symposium), Nov. 21-25, 2016, Kona, Hawaii, USA
18. S. Binetti "Inorganic based solar cells : research activity at MIBSOLAR – UNIMIB a ENEA Portici 3 maggio 2017
19. S. Binetti "Photoluminescence and infrared spectroscopy for impurities identification in silicon for photovoltaic applications" Workshop "Crystalline Silicon for Low Cost Photovoltaics" 10 July 2017 Paris (FRANCE)
20. S. Binetti "Chalcogenide thin film solar cells: research activity at UNIMIB-MIBSOLAR center "Italian-Kazak bilateral workshop "Our Common Future: Energy, Environment & Development" EXPO2017, Italian Pavilion, 30-31 August 2017 Astana . Kazakistan
21. S. BINETTI CHEETAH Webinar Kesterite Solar Cells: state of art and perspective 3rd November 2017 11:00 - 12:00 CET on line by CHEETAH webinar platform
22. S. Binetti "Photoluminescence and infrared spectroscopy for impurities identification in silicon for photovoltaic applications The 8th Forum on the Science and Technology of Silicon Materials 21-11-2018 Okayama (JAPAN) 21.11
23. S. Binetti XXIX AIV conference 8-10 maggio 2019
24. S. Binetti "Dislocations density reduction, mitigation and advanced characterization of crystalline defects and impurities for high efficiency, cost effective silicon cells made from mono-cast wafers" PHOTOWATT (Horizon 2020 PV-Impact project), 1 ottobre 2019 Lyon "Bourgoin-Jallieu, FRANCE

Invited communication at National conference

1. S. Binetti "Photoluminescence for Defects Identification in Silicon" Workshop Physics and Chemistry in silicon nanovoids Dipartimento di Fisica , Università di Modena 18/02/2008
2. S. Binetti "Le energie rinnovabili: motore per nuove imprese" Tavola rotonda Solar Expo Fiera Di Verona 7-9 maggio 2009, Verona
3. S. Binetti "Film sottili di CGIS su substrati flessibili" Tecnologie per un futuro fotovoltaico, 26 novembre 2009, Milano
4. S. Binetti "Coating organici per aumentare l'efficienza del silicio" Giornata di Studio su "Il futuro del silicio nel fotovoltaico" organizzata da IEEE Photonics 28 ottobre 2010 Trento
5. S. Binetti "Il fotovoltaico dalla prima alla terza generazione: sviluppo e applicabilità della ricerca", tavola rotonda. PV TECH 2010, 18 Novembre 2010 Milano, Italy
6. S. Binetti "Si solar cells: reasons of success, prospects to improve performance" Convegno "Materiali e superfici per il solare" organizzato da Poliefun Politecnico di Milano in collaborazione con PV Tech 2011, Enersolar+, 16 novembre 2011, Rho (Milano)
7. S. Binetti "Celle solari a film sottile: l'esperienza del centro MIBSOLAR" Giornata di studio "Il fotovoltaico in Italia: rischi e opportunità organizzato da associazione AEIT Italiana Politecnico di Milano, 29 novembre 2011 Milano
8. S. Binetti "MIBSOLAR researches on inorganic thin films " ZeroEmission Rome 2012, 5 settembre 2012, Roma
9. S. Binetti in "State of the art and perspective of inorganic photovoltaic: the research activity at MIBSOLAR" Italian National Conference on Condensed Matter Physics, 09-13 september 2013, Milano

10. S.Binetti “La Scienza dei Materiali per la scuola secondaria: interdisciplinarietà del progetto PLS” Smart Education & Tecnology Days - 3 giorni per la scuola" - XII edizione - Napoli, Città della Scienza, 9-10-11 ottobre 2014

PUBLICATION LIST

She has **published** 4 book chapters, 5 patents and more than 130 papers in peer and editor-reviewed international scientific journals ORCID Author ID: 7003698279 ; <http://orcid.org/0000-0002-8605-3896> .

BOOK CHAPTERS

1. S.Pizzini & S.Binetti “*Thin-film Si-based optoelectronics*” in Growth, Characterization and Electronic Applications of Si-based thin films, Ed. R.B. Bergmann, Research Signpost Publ. Kerala-India, p.101-128, (2002)(INDIA)
2. A. Le Donne & S. Binetti “*Solar spectrum modification to enhance silicon solar cells efficiency*” Chapter 16 del "Handbook of Silicon Photonics" Editors L.Vivien, L. Pavese CRC Press, Taylor & Francis Group (2013) ISBN 9781439836101 (USA)
3. S.Binetti & A. Sassella “*Investigation of defects and impurities in silicon by infrared and photoluminescence spectroscopies*” Chapter 10 del libro “Silicon, Germanium, and Their Alloys: Growth, Defects, Impurities, and Nanocrystals” Editors G.Kissinger, S.Pizzini CRC Press, Taylor & Francis Group (USA)
4. C. del Cañizo Nadal, , S. Binetti, & T. Buonassisi, (2016). *Purity requirements for silicon in photovoltaic applications*. In B. Ceccaroli (a cura di), *Solar Silicon Processes: Technologies, Challenges, and Opportunities* (pp. 1-47). CRC Press.

PATENTS

1. International patent n° W02014/053626°1 “*Organic dye for a dye sensitized solar cells*” data di pubblicazione 10 Aprile 2014. Inventori: Alessandro Abbotto, Maurizio Acciarri, Paolo Biagini, Simona Binetti, Titolare: ENI S.p.A. e Università Milano-Bicocca.
2. Italian Patent No. MI2012A001672 del 06/04/2014 Abbotto, A., Acciarri, M., Biagini, P., & Binetti,
3. European patent EP 13425019.0. “Plant and process for the production of a semiconductor film - N. EP2759619 del 30/07/2014 Acciarri Maurizio, Maurizio Meschia, Simona Binetti, Leo Miglio, Stefano Marchionna.
4. International PCT “Novel compounds for the capture of carbon dioxide from gaseous mixtures and subsequent release, related process and plant” n. PCT/IB2015/000038 del 16.01.2015
5. Italian patent “Nuovi composti per la cattura di anidride carbonica da miscele gassose e successivo rilascio, relativo procedimento e impianto” n. 102015000086665 del 27.06.2018

INTERNATIONAL, PEER-REVIEWED JOURNALS

1. S. Pizzini, M. Acciarri, S. Binetti: *Spectroscopical and electrical evidences about segregation effects in semiconductors*; Solid State Phenomena **19-20**, 479 (1991)

2. S. Binetti, M. Acciarri, S. Acerboni, S. Pizzini: *Interactions among point defects, oxygen and carbon in polycrystalline silicon*; Vuoto Vol. **XXII**, 93 (1992)
3. M. Acciarri, S. Acerboni, S. Binetti, S. Ferrari, S. Pizzini, M. Bosetti, G.P. Rancoita, M. Rattaggi, G. Terzi: *A Novel Method for the determination of radiation damage effects in silicon detectors*; Nuclear physics B **32**, 410 (1993) .
4. S. Pizzini, S. Binetti, M. Acciarri and S. Acerboni: *Interaction of oxygen, carbon and extended defects in silicon*; phys. stat. sol. (a) **138** , 451 (1993)
5. S. Binetti, S. Ferrari, M. Acciarri, S. Acerboni, R. Canteri and S. Pizzini: *New evidences about carbon and oxygen segregation processes in polycrystalline silicon*; Solid State Phenomena, **32-33**, 181 (1993) .
6. S. Pizzini, M. Acciarri, S. Binetti, S. Acerboni: *Determination of the electronic structure of grain boundaries by energy resolved photoconductivity*; Materials Sci. Eng., B **24** 159 (1994).
7. S. Pizzini, M. Acciarri, S. Binetti, S. Acerboni and C. Savigni: *Interaction of point and extended defects in silicon: their influence on the polycrystalline silicon substrate quality for high efficiency solar cells*; Semiconductor Silicon 1994 The Electrochemical Society, p. 756 (1994)
8. M. Acciarri, C. Savigni, S. Binetti and S. Pizzini: *Effect of local inhomogeneities on the electrical properties of polycrystalline silicon*; Solid State Phenomena, **37-38**, 219 (1994)
9. S. Acerboni, S. Pizzini, S. Binetti, M. Acciarri, B. Pichaud: *Effect of oxygen aggregation processes on the recombining activity of 60° dislocations in Czochralski grown silicon*; J.Appl. Phys. **76**, 2703 (1994) .
10. Pizzini, S., Binetti, S., Acciarri, M “*Chemistry of point defect in silicon and its applications in semiconductor technology*”Materials Research Society Symposium – Proceedings 378, pp. 913-927 (1995)
11. S. Binetti, M. Acciarri, A. Brianza, C. Savigni, S. Pizzini: *Effect of oxygen concentration on the diffusion length in Czochralski and magnetic Czochralski silicon*; Materials Science and Technology **11** 665 (1995) .
12. S. Binetti, M. Acciarri, C. Savigni, A. Brianza, S. Pizzini, A. Musinu: *Effect of nitrogen contamination by crucible encapsulation on polycrystalline silicon material quality*; Materials Sci. Eng. B **36**, 68 (1996) .
13. C. Savigni, M. Acciarri, S. Binetti: *About a novel gettering procedure for multycrystalline silicon samples*; Solid State Phenomena **51-52**, 485 (1996) .
14. M. Acciarri, S. Binetti, M. Garavaglia, S. Pizzini: *Detection of junction failures and other defects in silicon and III-V devices using the LBIC technique in lateral configuration* Materials Science and Engineering B **42**, 208 (1996) .
15. S. Pizzini, M. Acciarri, S. Binetti, D. Narducci, C. Savigni: *Recent Achievements in Semiconductor Defect Passivation*; Materials Science and Engineering B **45**, 126 (1997) .
16. S. Binetti, S. Basu, C. Savigni, M. Acciarri, S. Pizzini: *Passivation of extended defects in silicon by catalytically dissociated molecular hydrogen*; Journal de Physique III **7**, 1487 (1997)
17. S. Pizzini, M. Donghi, S. Binetti, I. Gelmi, A. Cavallini, B. Fraboni, G. Wagner: *Influence of the host composition on the equilibrium structure of Er-centres in silicon* Solid State Phenomena Vol **54**, 86 (1997) .
18. S. Binetti , M. Donghi, S. Pizzini, A.Castaldini, A. Cavallini, B. Fraboni, N.A. Sobolev: *Erbium in Silicon: Problems and Challenges*, Solid State Phenomena **57-58**, 197 (1997) .
19. S. Pizzini, M. Donghi, S. Binetti, G .Wagner, M.Bersani: *Luminescence from erbium-doped silicon epilayers grown by liquid phase epitaxy* J.Electrochem. Soc. **145**, L8 (1998) .
20. A.Cavallini, B.Fraboni, S.Pizzini, S.Binetti, S. Sanguinetti L.Lazzarini, G.Salviati:*Electrical and optical characterization of Er-doped silicon grown by liquid phase epitaxy*, J. Appl. Phys., **85** (3), 1582 (1999) .
21. S.Binetti, A. Cavallini, B.Fraboni, A.Dellafiore, B.Fraboni, E.Grilli, M.Guzzi, S.Pizzini S.Sanguinetti: *Erbium doped silicon epilayers grown by liquid-phase epitaxy* Journal of Luminescence **80**, 347 (1999)

22. A.Cavallini, B. Fraboni, S.Pizzini, S.Binetti, L.Lazzarini, G.Salviati: *Electrical and optical analyses of Er-doped silicon grown by liquid-phase epitaxy* Journal of Luminescence **80**, 343 (1999)
23. A.Cavallini, B. Fraboni, S.Pizzini, S.Binetti, L.Lazzarini, G.Salviati : *On the Influence of dislocations on the Luminescence of Si: Er* phys. stat. sol (a) **171**, 347 (1999)
24. S. Binetti, S. Pizzini, A. Cavallini, B. Fraboni, *Erbium doped silicon epilayers grown by liquid phase epitaxy* , Semiconductors **33**, (6) 596 (1999)
25. S.Pizzini, S.Binetti, D.Calcina, N.Morgante, A. Cavallini, *Local structure of erbium-oxygen complexes in erbium-doped silicon and its correlation with the optical activity of erbium* Materials Science and Engineering **B 72**, 173 (2000) .
26. Pizzini, S., Binetti, S., Acciarri, M., Casati, M. *Study of the radiative and non-radiative recombination processes at dislocations in silicon by photoluminescence and LBIC measurements* Materials Research Society Symposium – Proceedings 588, pp. 117-122 (2000)
27. S. Pizzini, S.Binetti, A.LeDonne. E.Leoni, M.Acciarri, G.Salviati, L.Lazzaroni *Beam Injection studies of dislocations and oxygen agglomeration in semiconductor silicon* Solid state phenomena **78-79**, 57 (2001)
28. M. Acciarri, S. Binetti, A. Racz, S. Pizzini, G. Agostinelli *Fast Lbic in-Line Characterization For Process Quality Control in The Photovoltaic Industry* Solar Energy Mat. and Solar Cells **72**, 417 (2002)
29. S. Binetti, S. Pizzini, E. Leoni, R. Somaschini, A. Castaldini, A. Cavallini *Optical properties of oxygen agglomerates in silicon*, Solid State Phenomena, **82-84**, 75 (2002)
30. S. Binetti, S.Pizzini, E.Leoni, R.Somaschini, A. Castaldini, A. Cavallini, *Optical properties of oxygen precipitates and dislocations in silicon* J.Appl. Phys. **92**, 2437 (2002)
31. M.Acciarri, C.Cirelli, S.Pizzini, S.Binetti, A. Castaldini, A.Cavallini, “*Study of the correlation between radiative and non-radiative recombination channels in silicon*” J.Phys. Condensed Matter, **14** 13223, (2002)
32. S.Binetti, R.Somaschini, A.LeDonne, E.Leoni, S.Pizzini, D.Li, D.Yang “*Dislocation luminescence in nitrogen-doped Czochralski and float zone silicon*” J.Phys.Condensed Matter, **14** 13247 (2002)
33. Pizzini, S., Binetti, S., Leoni, E., Acciarri, M., Castaldini, A. *Radiative recombination processes of thermal donors in silicon* Materials Research Society Symposium – Proceedings 692, pp. 275-281 (2002)
34. Binetti, S., Le Donne, A., Emtsev Jr., V.V., Emtsey, V.V., Pizzini, S. *Effect of pressure-enhanced single step annealing on the silicon photoluminescence* Materials Research Society Symposium – Proceedings 744, pp. 543-548 (2002)
35. S.Binetti, S.Pizzini, R.Somaschini A.Le Donne, D. Li, D. Yang “ *Effect of heat treatments on optical and electrical properties of nitrogen doped silicon samples*” Microelectronic Engineering **66**, 297 (2003)
36. S.Binetti, A.LeDonne, M.Acciarri, M.Cerminara, S.Pizzini “*Analysis of extended defects in 6H-SiC using photoluminescence and light beam induced current spectroscopy*” Materials Science Forum **433-436** 317 (2003)
37. Bollani, M., Binetti, S., Acciarri, M., (...), Pizzini, S., Von Känel, H. *Characterization of Nanocrystalline Silicon Film grown by LEPECVD for Photovoltaic Applications* Materials Research Society Symposium – Proceedings 762, pp. 565-570 (2003)
38. D. Cavalcoli, A.Cavallini, M.Rossi, S.Binetti, F.Izzia, S.Pizzini *Surface Contaminant Detection in Semiconductors Using Non-Contacting Techniques* Journal of Electrochem. Soc. **150** (8) G456-G460 2003
39. S.Binetti, A.Le Donne, V.V. Emtsev S.Pizzini “*Effect of high pressure isostatic annealing on oxygen segregation in Czochralski* J.Appl. Phys. **94** (12), 7476, (2003) ,

40. A. Le Donne, S. Binetti, M. Acciarri, A. Castaldini, F. Nava, , A. Cavallini, S. Pizzini *Electrical and optical characterization of electron irradiated X rays detectors based on 4H-SiC epitaxial layers* Material Science Forum **457** ,1503 (2004)
41. S.Pizzini, E.Leoni, M.Acciarri, A.Le Donne, B.Pichaud “*Luminescence of dislocations and oxide precipitates in Si*” Solid State Phenomena Vols. 98-96 273 (2004)
42. M. Acciarri, S.Binetti, O.V. Feklisova, E.A. Steinman, E.B. Yakimov “*Electrical and optical properties of dislocations Generated under Pure Conditions*” Solid State Phenomena **98-96** 453 (2004)
43. Le Donne, S.Binetti, M. Acciarri, S.Pizzini *Electrical characterization of electron irradiated X rays detectors based on 4H-SiC epitaxial layers.* Diamond and related Materials, **13/3** 414 (2004)
44. E.Leoni, L.Martinelli, S.Binetti, G.Borionetti, S.Pizzini “*The origin of the photoluminescence from oxygen precipitates nucleated at low temperature in semiconductor silicon*” J Electrochemical Society **151**, G866 (2004) .
45. E. Leoni, S. Binetti, B. Pichaud, S.Pizzini “*Dislocation luminescence in plastically deformed silicon crystals: effect of dislocation intersection and oxygen decoration*” Eur. Phys. J. Appl. Phys. **27**, 123-127 (2004)
46. [Li Dong-Sheng](#), [Yang De-Ren](#), [Leoni E.](#), [Binetti S.](#), [Pizzini S.](#) *Photoluminescence of dislocations in nitrogen doped Czochralski silicon* Chinese Physics Letters **21** (11) 2242-4 (2004)
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