europass Curriculum vitae

PERSONAL INFORMATION

Francesco **Biccari**

Via [redacted], 50141 Firenze, Italy

+39 [redacted]

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Date of birth 27 April 1980 | Nationality Italian

RESEARCH EXPERIENCE

Oct 2018 – present (RTDb)
Sept 2013 – Aug 2018 (RTDa)

Research fellow at the University of Florence (Italy)

Fixed-term researcher at the Dept. of Physics and Astronomy of the University of Florence. Main activities: growth and optical characterization (mainly photoluminescence) of semiconductor nanostructures and their integration in micro- and nano-optical resonators (e.g. photonic crystal cavities); optical characterization of new semiconductors for photovoltaics and optoelectronics (perovskites); writing of research projects; teaching; student supervision.

Mar 2010 – Feb 2013
(Assegno di Ricerca)

Postdoctoral researcher at the ENEA Casaccia Research Center (Italy)

Supervisor: dr. Alberto Mittiga. Activity: Fabrication and optical and electrical characterization of Cu_2ZnSnS_4 thin films. Fabrication and characterization of photovoltaic cells based on Cu_2ZnSnS_4. (Contracts: 22/3/2010-21/3/2011, 4/4/2011-3/4/2012, 2/5/2012-28/2/2013.)

Nov 2006 – Oct 2009

Ph.D. in Physics at the Sapienza – University of Rome (Italy)

Advisor: prof. Mario Capizzi. Activity: Fabrication and optical and electrical characterization of Cu_2O material and Cu_2O based photovoltaic cells. The experimental work was carried out at the ENEA Casaccia Research Center (Rome, Italy) under the supervision of dr. Alberto Mittiga. Thesis defended on 16 February 2010. (Download)

Oct 1999 – Sept 2005

Master's degree in Physics at the Sapienza – University of Rome (Italy)

Specialization: Nuclear and subnuclear physics. Final grade: 110 *cum laude* (out of 110). Thesis defended on 29 September 2005. (Download)
4 months of the thesis period were spent at Fermilab Laboratory in Chicago (USA).

Aug 2004 – Sept 2004

Summer student at Fermilab (Chicago, USA)

Selected for a formation experience in particle physics, paid by the Dept. of Energy of the USA.

OTHER JOBS

Sept 2014

Consultant for the Italian division of the Pearson publishing house. Content analysis for the Italian adaptation of the book Sear's & Zemansky's University Physics.

June 2012

Consultant for the Sapienza University Press (Italy). Programming of 3 LaTeX classes for books, articles and conference proceedings.

Oct 2005 – Sept 2006

Software engineer (SAS and SQL ORACLE) at Citel group (Italy), involved in the Billing Assurance area of Telecom Italia company for the company's database management.

SCIENTIFIC HIGHLIGHTS

Citation analysis (Scopus) 31 articles and 6 conference proceedings; Citations: 522; h-index: 10. See Attachment 2.

Funded projects

2019–2020: Principal investigator of "EPICO" (2018.0950, 1 year, 16 k€), funded by Ente Cassa di Risparmio di Firenze. Topic: inorganic perovskites for optoelectronic applications.

2017–2018: Principal investigator of "PERBACCO" (2016.1084, 1 year, 30 k€), funded by Ente Cassa di Risparmio di Firenze. Topic: inorganic perovskites for optoelectronic applications.

2017: Winner of the Italian MIUR Funding programme for basic research activities (3 k€).

2013–2017: Unit coordinator of the FIRB project "DeLIGHTeD" (RBFR12RS1W, 3 years, 1 M€), funded by Italian Ministry of Education and Research. Topic: GaAsN site-controlled quantum dots and their integration with photonic crystal structures.

Awards

2018: *Abilitazione Scientifica Nazionale* as *prof. di seconda fascia* in *Fisica Sperimentale della Materia* (02/B1). Valid until 30 March 2024.

2018: Frontispiece of the Advanced Materials journal. (See article no. 27).

2015: Most cited paper of the J. of Renewable and Sustainable Energy (See article no. 9).

2014: Paper selected for the "Highlights of 2013" of IOP (See article no. 6).

Conferences Organizer of Plasmonica 2018. Presentations, also as invited speaker, at many international scientific conferences. See the Attachment 3 for a complete list.

Reviewer activity Scientific reviewer for international scientific journals: Advanced Materials (Wiley-VCH), Scientific Reports (Springer Nature), Journal of The Electrochemical Society (ECS), Applied Physics Letters (AIP Publishing), Journal of Alloys and Compounds (Elsevier), and many others.

TEACHING EXPERIENCE

Thesis supervision at the University of Florence

Oct 2018 – July 2019	A. Ristori. Laser writing of quantum dots by photonic jets. (MSc)
Oct 2015 – Oct 2018	F. Gabelloni. Optical spectroscopy of advanced materials for energy harvesting. (PhD)
Jan 2016 – Oct 2016	A. Boschetti. Site-controlled single photon sources fabricated with light. (MSc)
Mar 2016 – June 2016	A. Ristori. Stimulated emission in microstructured perovskites. (BSc)
Dec 2014 – Mar 2015	C. Mannucci. Optical characterization of GaAs quantum wells on patterned Si substrates. (BSc)
Mar 2014 – Mar 2015	G. Fiaschi. Optical characterization of site-controlled GaAsN Quantum Dots. (MSc)

University teaching

2014/2015 – 2019/2020	Solid State Physics Laboratory. MSc in Physics at UniFi. (3 CFU)
2014/2015 – 2019/2020	Physics Laboratory. BSc in Biology at UniFi. (3 CFU)
2013/2014	Physics I (mechanics). BSc in Civil, Constr. and Env. Engineering at UniFi. (3 CFU)
2013/2014	Physics II (electromagnetism). BSc in Civil, Constr. and Env. Engineering at UniFi. (3 CFU)
Apr 2011 and Apr 2012	CdTe and CIGS lectures in the course of "Conventional photovoltaic technologies" for the post-graduate "Master Course in Photovoltaic Engineering" at the University of Rome "Tor Vergata".
2007/2008 and 2008/2009	Teaching assistant at Sapienza – University of Rome. "Physics 1" course (mechanics and thermodynamics) of the BSc degree program in Mathematics. Head professor: prof. S. Caprara.

Secondary school teaching

Sept 2016	Winner of the national Italian public competition to obtain a permanent position as professor in high schools. Ranked 3rd in Lazio region for Mathematics and Physics class (A027), 3rd for Physics class (A020), and 7th for Mathematics class (A026). All declined in September 2017.
Jan 2013 – June 2013	*TFA* in mathematics and physics (qualifying program to teach in upper secondary schools) at Sapienza – University of Rome. Qualification obtained on 9 July 2013 with a grade of 99 (out of 100). *Classe di abilitazione A027 (ex A049) e a cascata A020, A026, A047.*
Jan 2012 – June 2012	Substitute teacher of computer science at the Public Professional Institute Stendhal in Rome.

LANGUAGES

Mother tongue: Italian

Other languages

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	B2	C1	B2	C1	C1

Levels: A1 and A2: Basic user – B1 and B2: Independent user – C1 and C2: Proficient user
Common European Framework of Reference for Languages

COMPUTER SKILLS

Languages: Data acquisition and analysis: Python, Matlab, Visual Basic, C++, LabVIEW
Others: LaTeX (several professional works), HTML, CSS, PHP

Databases: SQL/ORACLE and SAS (1 year work experience).
Basic knowledge of Microsoft Access and MySQL.

Operating systems: All Microsoft OS's and Linux based OS's

ATTACHMENTS

1 Scientific activity
2 Full list of publications
3 Full list of conferences participation and organization
4 Scientific collaborations

Firenze, 15/9/2019

Francesco Biccari

Attachment 1: Scientific activity

The numbers in parentheses refer to the full publication list as reported in the Article section of Attachment 2.

Dr. F. Biccari was born in 1980 in Rome (Italy) and he is a research fellow (*RTDb*) at the University of Florence (Italy), Dept. of Physics and Astronomy. The scientific career of F. Biccari can be divided in two periods: the first period covers the years 2008-2013, comprising the PhD and the assistant researcher activity at ENEA, while the second period starts at the end of 2013, after accepting a fixed term researcher position at the University of Florence. Both periods were mainly devoted to the study of the optical and electronic properties of semiconductor materials for applications in photovoltaics (first period), and nanostructures and nanophotonics (second period).

The first period was devoted to the growth and characterization of new low-cost materials for photovoltaic applications, like cuprous oxide (Cu_2O) and kesterites (CZTS), two hot-topics in the photovoltaic research. These materials, and the corresponding solar cells, were grown by different deposition techniques (furnace, sputtering, evaporation, chemical synthesis, ...) and characterized by several techniques, in particular optical (PL, spectrophotometry, Raman, ...), electrical (4-point, Hall, I-V, I-T, C-V, DLTS, TSC, ...) and structural (SEM-SE, SEM-RBS, EDS, XRD, ...). This wide range of growth and characterization techniques gave F. Biccari a large experience on semiconductor properties and material defects. Almost all the papers published in this period include his PhD supervisor among the authors [1–9]. But in fact, F. Biccari already had some freedom in the planning of the experiments, as shown by the fact that he was the corresponding author of several papers [2–4]. In this period he published distinguished works in the field. For example, he proposed a new model for the defects of Cu_2O [1], he assessed its optical properties [3], still unclear at that time, and he studied the doping of Cu_2O, showing that chlorine is a good p-type dopant [2]. The paper on the optical properties of Cu_2O [3] is the most cited of F. Biccari and it is the reference paper for the optical properties of this material. Moreover his PhD thesis is one of the most cited review paper on Cu_2O (about 50 citations according to Google Scholar). As regards the CZTS, at first, his research was mainly devoted to its growth [4]. Then, he studied the band alignment at the pn-junction CZTS/CdS [6], employed in solar cells, which was still unclear before his studies. This work was awarded as “Paper selected for highlight of 2013 of Institute of Physics (IOP)”. Finally, he studied the band-gap variations due to deviations from perfect stoichiometry [8]. A paper on the same topic [9] was awarded as the “Most Cited Articles of J. of Renewable and Sustainable Energy from 2015”.

The second research period of the F. Biccari’s career starts at the end of 2013, when he moved to the University of Florence to work on a more futuristic line of research, embracing Nanotechnology and Photonics. From then on, he worked as an independent researcher. This was possible because he became the unit leader of a research project granted by the Italian Ministry of Education, University and Research (DeLIGHTeD project, FIRB-2012, 1 M€, 2013-2017). The project, a collaboration with Dr. M. Felici (Sapienza - University of Rome, principal investigator) and Dr. G. Pettinari (CNR-IFN, unit leader), dealt with GaAsN site-controlled quantum dots and their integration with photonic crystal structures. Within this project F. Biccari gained expertise in studying the optical and electronic properties of dilute nitrides and their response to hydrogen incorporation for the realization of quantum dot coupled to photonic crystal cavities [18,26,27,28]. In particular, using an innovative laser-writing technique based on hydrogen removal from GaAsN:H by a SNOM tip, he successfully demonstrated the possibility to fabricate site-controlled and emission energy-controlled QDs [27] (this work, published on Advanced Materials, is the highest impact factor work of F. Biccari and it was awarded with a frontispiece). His experience embraced also other types of quantum emitters: site-controlled natural quantum dots [23], Ge-related single-photon emitters in AlGaAs [10], dot-ring coupled nanostructures [16], carbon nanotubes and their integration in photonic crystal cavities [13,17]. As regards the study of photonic structures, F. Biccari worked on photonic crystal cavities [25,28], disordered photonic structures [12,20], near-field imaging of electromagnetic modes in waveguides [19]. He also maintained his interest in photovoltaics, publishing a high impact factor paper on graphene applied to perovskite solar cells [22], and becoming the principal investigator of a small project on inorganic perovskites. In this period F. Biccari learned to undertake and manage successfully research programmes and acquired several research skills of particular relevance for the submission of other projects. From the scientific point of view, he assembled and tuned several PL experimental setups with different laser sources (CW, picosecond, femtosecond) and with several capabilities (TCSPC and streak camera for time-resolved measurements, Hanbury Brown and Twiss setup for correlation measurements, confocal PL microscopes for high spatial resolution), becoming skilled in the high spatial and temporal optical spectroscopy of semiconductor nanostructures. He also gained some experience with Scanning Near-field Optical Microscopy (SNOM), used to obtain spatial resolutions below the diffraction limit and to map the electromagnetic modes of photonic structures. F. Biccari is also associated to the European Laboratory for Non-linear Spectroscopy (LENS) where he is the person in charge for the micro-photoluminescence laboratory.

Information about awards, metrics and other scientific highlights can be found on the first page of this resumé.

Attachment 2: Full list of publications

The impact factor refers to the publication date. The asterisk (*) indicates the corresponding author.

Books and book chapters

2 **F. Biccari***, M. Bruzzi, F. Gabelloni, N. Calisi, A. Vinattieri.
"Defects in perovskites for solar cells and LEDs".
Chapter XX in "Defects in Functional Materials" (Eds.: F. C. Ling, S. Zhou, A. Kuznetsov), World Scientific Publishing, (2020).
DOI: 10.1142/11352 ISBN: 978-9811203169 Scopus: — WoS: — IF: — F: y

1 **F. Biccari***.
"Defects and doping in Cu_2O".
Lulu Press, Inc., (2012). (Publication of F. Biccari's PhD thesis).
DOI: — ISBN: 978-1471633812 Scopus: — WoS: — IF: — F: y

Articles

31 F. Gabelloni, **F. Biccari**, N. Falsini, N. Calisi, S. Caporali, A. Vinattieri.
"Long-living nonlinear behavior in $CsPbBr_3$ carrier recombination dynamics".
Nanophotonics, 8 (2019), 1447.
DOI: 10.1515/nanoph-2019-0013 ISSN: 2192-8614 Scopus: 2-s2.0-85064667641 WoS: WOS:— IF: 6.01 F: n

30 A. Gerardino, G. Pettinari, N. Caselli, S. Vignolini, F. Riboli, **F. Biccari**, M. Felici, A. Polimeni, A. Fiore, M. Gurioli, F. Intonti.
"Coupled Photonic Crystal Nanocavities as a Tool to Tailor and Control Photon Emission".
Ceramics, 2 (2019), 34.
DOI: 10.3390/ceramics2010004 ISSN: 2571-6131 Scopus: — WoS: WOS:— IF: — F: n

29 E. Durán-Valdeiglesias, W. Zhang, C. Alonso-Ramos, S. Serna, X. Le Roux, D. Maris-Morini, N. Caselli, **F. Biccari**, M. Gurioli, A. Filoramo, E. Cassan, L. Vivien.
"Tailoring carbon nanotubes optical properties through chirality-wise silicon ring resonators".
Scientific reports, 8 (2018), 11252.
DOI: 10.1038/s41598-018-29300-1 ISSN: 2045-2322 Scopus: 2-s2.0-85050656558 WoS: WOS:000439805700013 IF: 4.122 F: y

28 G. Pettinari, M. Felici, **F. Biccari**, M. Capizzi, A. Polimeni.
"Site-controlled quantum emitters in dilute nitrides and their integration in photonic crystal cavities".
Photonics, 5 (2018), 10.
DOI: 10.3390/photonics5020010 ISSN: 2304-6732 Scopus: 2-s2.0-85048927008 WoS: WOS:000436510400005 IF: — F: y

27 **F. Biccari***, A. Boschetti, G. Pettinari, F. La China, M. Gurioli, F. Intonti, A. Vinattieri, M. S. Sharma, M. Capizzi, A. Gerardino, L. Businaro, M. Hopkinson, A. Polimeni, M. Felici.
"Site-controlled single-photon emitters fabricated by near field illumination".
Advanced Materials, 30 (2018), 1705450.
DOI: 10.1002/adma.201705450 ISSN: 1521-4095 Scopus: 2-s2.0-85044747230 WoS: WOS:000434032600001 IF: 19.79 F: y
Highest impact factor among F. Biccari's publications. Winner of Advanced Materials internal cover (Advanced Materials, 30 (2018), 1870147)

26 M. Felici, G. Pettinari, **F. Biccari**, M. Capizzi, A. Polimeni.
"Spatially selective hydrogen irradiation of dilute nitride semiconductors: a brief review".
Semiconductor Science and Technology, 33 (2018), 053001.
DOI: 10.1088/1361-6641/aab3f1 ISSN: 0268-1242 Scopus: 2-s2.0-85046682948 WoS: WOS:000428873000001 IF: 2.31 F: y

25 N. Caselli, F. Intonti, F. La China, **F. Biccari**, F. Riboli, A. Gerardino, Lianhe Li, E. H. Linfield, F. Pagliano, A. Fiore, M. Gurioli.
"Generalized Fano lineshapes reveal exceptional points in photonic molecules".
Nature Communications, 9 (2018), 396.
DOI: 10.1038/s41467-018-02855-3 ISSN: 2041-1723 Scopus: 2-s2.0-85041124791 WoS: WOS:000423430900016 IF: 12.12 F: y

24 F. Gabelloni, **F. Biccari***, G. Andreotti, D. Balestri, S. Checcucci, A. Milanesi, N. Calisi, S. Caporali, A. Vinattieri.
"Recombination dynamics in $CsPbBr_3$ nanocrystals: role of surface states".
Optical Materials Express, 7 (2017), 4367.
DOI: 10.1364/OME.7.004367 ISSN: 2159-3930 Scopus: 2-s2.0-85036475335 WoS: WOS:000417036200017 IF: 2.591 F: y

23 **F. Biccari***, L. Esposito, C. Mannucci, A. G. Taboada, S. Bietti, A. Ballabio, A. Fedorov, G. Isella, H. von Känel, L. Miglio, S. Sanguinetti, A. Vinattieri, M. Gurioli.
"Site-controlled Natural GaAs(111) quantum dots fabricated on vertical GaAs/Ge microcrystals on deeply patterned Si(001) substrates".
Nanoscience and Nanotechnology Letters, 9 (2017), 1108.
DOI: 10.1166/nnl.2017.2440 ISSN: 1941-4900 Scopus: 2-s2.0-85027965984 WoS: WOS:000410792700018 IF: 1.889 F: y

22 **F. Biccari**, F. Gabelloni, E. Burzi, M. Gurioli, S. Pescetelli, A. Agresti, A. E. Del Rio Castillo, A. Ansaldo, E. Kymakis, F. Bonaccorso, A. Di Carlo, A. Vinattieri.
"Graphene-based electron transport layers in perovskite solar cells: a step-up for an efficient carrier collection".
Advanced Energy Materials, 7 (2017), 1701349.
DOI: 10.1002/aenm.201701349 ISSN: 1614-6840 Scopus: 2-s2.0-85028617881 WoS: WOS:000417350000030 IF: 16.721 F: y

21 T. H. C. Hoang, E. Durán-Valdeiglesias, C. Alonso-Ramos, S. Serna, W. Zhang, M. Balestrieri, A. Keita, N. Caselli, **F. Biccari**, X. Le Roux, A. Filoramo, M. Gurioli, L. Vivien, E. Cassan.
"Narrow-linewidth carbon nanotube emission in silicon hollow-core photonic crystal cavity".
Optics Letters, 42 (2017), 2228.
DOI: 10.1364/OL.42.002228 ISSN: 0146-9592 Scopus: 2-s2.0-85020434585 WoS: WOS:000403534700045 IF: 3.416 F: y

20 N. Caselli, F. Intonti, F. La China, **F. Biccari**, F. Riboli, A. Gerardino, L. Li, E. H. Linfield, F. Pagliano, A. Fiore, M. Gurioli.
"Near-field speckle imaging of light localization in disordered photonic systems".
Applied Physics Letters, 110 (2017), 081102.
DOI: 10.1063/1.4976747 ISSN: 0003-6951 Scopus: 2-s2.0-85013855312 WoS: WOS:000394762600002 IF: 3.142 F: y

19 N. Caselli, T. H. C. Hoang, X. Le Roux, F. Sarti, **F. Biccari**, F. La China, F. Intonti, A. Vinattieri, L. Vivien, E. Cassan, M. Gurioli.
"Vectorial near-field imaging of silicon heterostructure cavities in air-slot waveguides".
IEEE Photonics Technology Letters, 29 (2017), 571.
DOI: 10.1109/LPT.2017.2664900 ISSN: 1041-1135 Scopus: 2-s2.0-85015730773 WoS: WOS:000398611700004 IF: 1.945 F: y

18 G. Pettinari, A. Gerardino, L. Businaro, A. Polimeni, M. Capizzi, M. Hopkinson, S. Rubini, **F. Biccari**, F. Intonti, A. Vinattieri, M. Gurioli, M. Felici.
"A lithographic approach for quantum dot-photonic crystal nanocavity coupling in dilute nitrides".
Microelectronic Engineering, 174 (2017, 2016 online), 16.
DOI: 10.1016/j.mee.2016.12.003 ISSN: 0167-9317 Scopus: 2-s2.0-85006976062 WoS: WOS:000401381000005 IF: 1.277 F: y

17 **F. Biccari***, F. Sarti, N. Caselli, A. Vinattieri, E. Durán-Valdeiglesias, W. Zhang, C. Alonso-Ramos, T. H. C. Hoang, S. Serna, X. Le Roux, E. Cassan, L. Vivien, M. Gurioli.
"Single walled carbon nanotubes emission coupled with a silicon slot-ring resonator".
Journal of Luminescence, 191 (2017, 2016 online), 126.
DOI: 10.1016/j.jlumin.2016.11.040 ISSN: 0022-2313 Scopus: 2-s2.0-85007049097 WoS: WOS:000410017300010 IF: 2.693 F: y

16 **F. Biccari**, S. Bietti, L. Cavigli, A. Vinattieri, R. Nötzel, M. Gurioli, S. Sanguinetti.
"Temperature activated coupling in topologically distinct semiconductor nanostructures".
Journal of Applied Physics, 120 (2016), 134312.
DOI: 10.1063/1.4963718 ISSN: 0021-8979 Scopus: 2-s2.0-84990864120 WoS: WOS:000386155100018 IF: 2.101 F: y

15 F. La China, N. Caselli, F. Sarti, **F. Biccari**, U. Torrini, F. Intonti, A. Vinattieri, E. Durán-Valdeiglesias, C. Alonso Ramos, X. Le Roux, M. Balestrieri, A. Filoramo, L. Vivien, M. Gurioli.
"Near-field imaging of single walled carbon nanotubes emitting in the telecom wavelength range".
Journal of Applied Physics, 120 (2016), 123110.
DOI: 10.1063/1.4963367 ISSN: 0021-8979 Scopus: 2-s2.0-84989186747 WoS: WOS:000385560700010 IF: 2.101 F: y

14 E. Durán-Valdeiglesias, W. Zhang, A. Noury, C. Alonso-Ramos, T. H. C. Hoang, S. Serna, X. Le Roux, E. Cassan, N. Izard, F. Sarti, U. Torrini, **F. Biccari**, A. Vinattieri, M. Balestrieri, A. Keita, H. Yang, V. Bezugly, G. Cuniberti, A. Filoramo, M. Gurioli, L. Vivien.
"Integration of carbon nanotubes in silicon strip and slot waveguide micro-ring resonators".
IEEE Transactions on Nanotechnology, 15 (2016), 583.
DOI: 10.1109/TNANO.2016.2556225 ISSN: 1536-125X Scopus: 2-s2.0-84978737275 WoS: WOS:000380026400003 IF: 2.485 F: y

13 F. Sarti, **F. Biccari**, F. Fioravanti, U. Torrini, A. Vinattieri, V. Derycke, M. Gurioli, A. Filoramo.
"Highly selective sorting of semiconducting single-walled carbon nanotubes for light emission at telecom wavelengths".
Nano Research, 9 (2016), 2478.
DOI: 10.1007/s12274-016-1134-6 ISSN: 1998-0124 Scopus: 2-s2.0-84976407445 WoS: WOS:000380726200026 IF: 7.010 F: y

12 N. Caselli, F. Riboli, F. Intonti, F. La China, **F. Biccari**, A. Gerardino, M. Gurioli.
"Spatial steadiness of individual disorder modes upon controlled spectral tuning".
APL Photonics, 1 (2016), 041301.
DOI: 10.1063/1.4946852 ISSN: 2378-0967 Scopus: 2-s2.0-85013750493 WoS: WOS:000385588400002 IF: — F: y

11 V. Latini, E. Tisbi, E. Placidi, F. Patella, **F. Biccari**, M. Gurioli, A. Vinattieri, F. Arciprete.
"Tuning the growth for a selective nucleation of chains of Quantum Dots behaving as single photon emitters".
Journal of Crystal Growth, 457 (2017, 2016 online), 177.
DOI: 10.1016/j.jcrysgro.2016.06.045 ISSN: 0022-0248 Scopus: 2-s2.0-84996791571 WoS: WOS:000389590700031 IF: 1.698 F: y

10 N. Dotti, F. Sarti, S. Bietti, A. Azarov, A. Kuznetsov, **F. Biccari**, A. Vinattieri, S. Sanguinetti, M. Abbarchi, M. Gurioli.
"Germanium-based quantum emitters towards a time-reordering entanglement scheme with degenerate exciton and biexciton states".
Physical Review B, 91 (2015), 205316.
DOI: 10.1103/PhysRevB.91.205316 ISSN: 1098-0121 Scopus: 2-s2.0-84930960069 WoS: WOS:000355315400005 IF: 3.664 F: y

9 C. Malerba, C. L. Azanza Ricardo, M. Valentini, **F. Biccari**, M. Müller, L. Rebuffi, E. Esposito, P. Mangiapane, P. Scardi, A. Mittiga.
"Stoichiometry effect on Cu_2ZnSnS_4 thin films morphological and optical properties".
Journal of Renewable and Sustainable Energy, 6 (2014), 011404.
DOI: 10.1063/1.4866258 ISSN: 1941-7012 Scopus: 2-s2.0-84901844916 WoS: WOS:000332320200014 IF: 1.510 F: y
"Most Cited Articles of the Journal of Renewable and Sustainable Energy from 2015"

8 C. Malerba, **F. Biccari**, C. L. Azanza Ricardo, M. Valentini, R. Chierchia, M. Müller, A. Santoni, E. Esposito, P. Mangiapane, P. Scardi, A. Mittiga.
"CZTS stoichiometry effects on the band gap energy".
Journal of Alloys and Compounds, 582 (2014, 2013 online), 528.
DOI: 10.1016/j.jallcom.2013.07.199 ISSN: 0925-8388 Scopus: 2-s2.0-84883636490 WoS: WOS:000325468100087 IF: 2.390 F: y

7 F. Nanni, F. R. Lamastra, F. Franceschetti, **F. Biccari**, I. Cacciotti.
"Mo-doped indium oxide films by dip-coating: synthesis, microstructure and optical properties".
Ceramics International, 40 (2014, 2013 online), 1851.
DOI: 10.1016/j.ceramint.2013.07.087 ISSN: 0272-8842 Scopus: 2-s2.0-84888016291 WoS: WOS:000330820600074 IF: 1.789 F: y

6 A. Santoni, **F. Biccari**, C. Malerba, M. Valentini, R. Chierchia and A. Mittiga.
"Valence Band Offset at the CdS/Cu_2ZnSnS_4 interface probed by X-ray Photoelectron Spectroscopy".
Journal of Physics D: Applied Physics, 46 (2013), 175101.
DOI: 10.1088/0022-3727/46/17/175101 ISSN: 0022-3727 Scopus: 2-s2.0-84876502242 WoS: WOS:000317389600008 IF: 2.544 F: y
Selected for Highlight of 2013 of IOP

5 C. Malerba, C. L. Azanza Ricardo, M. D'Incau, **F. Biccari**, P. Scardi, A. Mittiga.
"Nitrogen doped Cu_2O: a possible material for intermediate band solar cells?".
Solar Energy Materials and Solar Cells, 105 (2012), 192.
DOI: 10.1016/j.solmat.2012.06.017 ISSN: 0927-0248 Scopus: 2-s2.0-84862986201 WoS: WOS:000308386000029 IF: 4.593 F: y

4 **F. Biccari***, R. Chierchia, M. Valentini, P. Mangiapane, E. Salza, C. Malerba, C. L. Azanza Ricardo, L. Mannarino, P. Scardi, A. Mittiga.
"Fabrication of Cu_2ZnSnS_4 solar cells by sulfurization of evaporated precursors".
Energy Procedia, 10 (2011), 187.
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3 C. Malerba, **F. Biccari***, C. L. Azanza Ricardo, M. D'Incau, P. Scardi, A. Mittiga.
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– E. Durán-Valdeiglesias, W. Zhang, C. A. Alonso-Ramos, T. H. C. Hoang, S. Serna, X. Le Roux, M. Balestrieri, D. Marris-Morini, N. Caselli, **F. Biccari**, M. Gurioli, A. Filoramo, E. Cassan, L. Vivien.
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"Hybrid integration of carbon nanotube emitters into silicon photonic nanoresonators (Conference Presentation)".
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"Efficient excitation of silicon photonic cavity modes from carbon nanotube photoluminescence".
Proc. of the Asia Communications and Photonics Conference (ACP 2017), Guangzhou, China, (2017), S3J.3.
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"Integration of carbon nanotubes on silicon photonics resonators".
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– E. Durán-Valdeiglesias, W. Zhang, T. H. C. Hoang, C. Alonso-Ramos, S. Serna, X. Le Roux, E. Cassan, M. Balestrieri, A. Keita, F. Sarti, **F. Biccari**, U. Torrini, A. Vinattieri, H. Yang, V. Bezugly, G. Cuniberti, A. Filoramo, M. Gurioli, L. Vivien.
"Integration of carbon nanotubes in slot waveguides (Conference Presentation)".
Proc. of the conference SPIE Photonics Europe 2016, Brussel (Silicon Photonics and Photonic Integrated Circuits V, Conference 9891), (2016), 98910Q.
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2 F. Sarti, N. Caselli, F. La China, **F. Biccari**, U. Torrini, F. Intonti, A. Vinattieri, E. Durán-Valdeiglesias, W. Zhang, A. Noury, C. Alonso-Ramos, T. H. C. Hoang, S. Serna, X. Le Roux, E. Cassan, N. Izard, H. Yang, V. Bezugly, G. Cuniberti, A. Filoramo, L. Vivien, M. Gurioli.
"Coupling of semiconductor carbon nanotubes emission with silicon photonic micro ring resonators".
Proc. of the conference SPIE Photonics Europe 2016, Brussel (Silicon Photonics and Photonic Integrated Circuits V, Conference 9891), (2016), 98910P.
DOI: 10.1117/12.2234979 ISBN: 978-1510601369 Scopus: 2-s2.0-84982252190 WoS: WOS:000391521900017 IF: — F: y

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"GaAs nanostructures on Si platform".
Proc. of the Opto-Electronics and Communications Conference (OECC), 2015, (2015), 1–3.
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Istituto Veneto di Scienze, Lettere ed Arti, Venezia - Unione Matematica Italiana, Bologna
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– **F. Biccari***, C. Malerba, A. Mittiga.
"Impurity effects in Cu_2O".
arXiv preprint, 1310.5341 (2013). URL: http://arxiv.org/abs/1310.5341.
DOI: — Scopus: — WoS: — IF: — F: n

– M. Valentini, C. Malerba, **F. Biccari**, E. Salza, A. Santoni, C.L. Azanza Ricardo, P. Scardi, A. Mittiga.
"Study of CZTS Solar Cells Obtained from Two Different Types of Precursors".
Proc. of the 28th European Photovoltaic Solar Energy Conference, Paris, France, (2013), p. 2459.
DOI: 10.4229/28thEUPVSEC2013-3BV.6.64 ISBN: 3-936338-33-7 Scopus: — WoS: — IF: — F: y

– M. Valentini, C. Malerba, **F. Biccari***, R. Chierchia, P. Mangiapane, E. Salza, A. Mittiga.
"Growth and characterization of Cu_2ZnSnS_4 thin films prepared by sulfurization of evaporated precursors".
Proc. of the 26th European Photovoltaic Solar Energy Conference, Hamburg, Germany, (2011), p. 2911.
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– **F. Biccari**, C. Malerba, A. Mittiga.
"Metastability effects in Cu_2O solar cells".
Proc. of the 23rd European Photovoltaic Solar Energy Conference, Valencia, Spain, (2008), p. 583.
DOI: 10.4229/23rdEUPVSEC2008-1CV.2.54 ISBN: 3-936338248 Scopus: — WoS: — IF: — F: y

Attachment 3: Full list of conferences participation and organization

The asterisk (*) indicates the presenting author.

Organization

1 Organizing committee: **F. Biccari**, F. Intonti, F. Pineider, C. Toninelli.
Plasmonica 2018. (website http://www.plasmonica.it/2018/)
Florence, University of Florence, 4 – 6 july 2018.

Participation

14 **F. Biccari***, F. Gabelloni, G. Andreotti, M. Gurioli, N. Calisi, S. Caporali, A. Vinattieri.
Carrier cooling dynamics in inorganic perovskites.
ICPS 2018 (International Conference on the Physics of Semiconductors).
Montpellier (France), Corum conference center, 29 July – 3 August 2018.

13 **F. Biccari***, A. Boschetti, G. Pettinari, F. La China, M. Gurioli, F. Intonti, A. Vinattieri, M.S. Sharma, M. Capizzi, A. Gerardino, L. Businaro, M. Hopkinson, A. Polimeni, M. Felici.
Site-controlled single photon emitters fabricated by near field illumination.
ICPS 2018 (International Conference on the Physics of Semiconductors).
Montpellier (France), Corum conference center, 29 July – 3 August 2018.

12 INVITED **F. Biccari***, F. Gabelloni, G. Andreotti, D. Balestri, S. Checcucci, M. Gurioli, N. Calisi, A. Milanesi, S. Caporali, M. Bruzzi, A. Vinattieri.
Metal Halide Perovskites: A New Route in Optoelectronics.
ICAE 2017 (International Conference on Advanced Electromaterials).
Jeju (South Korea), Ramada Plaza Jeju Hotel, 21 – 24 November 2017.

11 INVITED **F. Biccari***, F. La China, A. Boschetti, G. Fiaschi, F. Intonti, A. Vinattieri, M. Gurioli, M. Felici, S. Birindelli, A. Polimeni, M. Capizzi, G. Pettinari, L. Businaro, A. Gerardino, S. Rubini.
Site-controlled Quantum Dots for nanophotonics applications.
Advances in Photonics and Applications 2016.
Firenze (Italy), Palazzo Nonfinito, 9 – 10 June 2016.

10 **F. Biccari***, F. Gabelloni, C. Francioni, F. La China, N. Caselli, F. Intonti, M. Gurioli, J. Lee, S. Leblebici, A. Weber-Bargioni, A. Vinattieri.
Superlinear emission in bare perovskite: amplified spontaneous emission in disordered film versus single crystal lasing.
EMRS 2016 (European Material Research Society Conference).
Lille (France), Grand Palais, 2 – 6 May 2016.
Note: See paper n. 30.

9 **F. Biccari***, F. Sarti, N. Caselli, A. Vinattieri, E. Durán-Valdeiglesias, W. Zhang, C. Alonso-Ramos, T. H. C. Hoang, S. Serna, X. Le Roux, E. Cassan, L. Vivien, M. Gurioli.
Single walled carbon nanotubes emission coupled with a silicon slot-ring resonator.
EMRS 2016 (European Material Research Society Conference).
Lille (France), Grand Palais, 2 – 6 May 2016.
Note: The conference paper has been selected as one of the best and it was awarded with the publication in the Elsevier Journal of Photoluminescence (see paper n. 26).

8 **F. Biccari***, F. La China, A. Boschetti, F. Intonti, A. Vinattieri, M. Gurioli, M. Felici, A. Polimeni, M. Capizzi, S. Birindelli, G. Pettinari, A. Gerardino.
Making quantum light emitters with light.
EMRS 2016 (European Material Research Society Conference).
Lille (France), Grand Palais, 2 – 6 May 2016.

7 **F. Biccari***, G. Fiaschi, F. Sarti, A. Vinattieri, M. Gurioli, S. Birindelli, M. Felici, G. Pettinari, A. Gerardino, A. Polimeni, M. Capizzi.
Optical characterization of site-controlled quantum dots obtained by hydrogenation of Ga(AsN)/GaAs quantum wells.
ICDS 2015 (International Conference on Defects in Semiconductors).
Espoo (Finland), Otaniemi campus of the Aalto University, 27 – 31 July 2015.

6 F. Sarti, **F. Biccari***, F. Fioravanti, U. Torrini, A. Vinattieri, M. Gurioli, A. Filoramo, V. Derycke, V. Bezugly, H. Yang, G. Cuniberti, X. Le Roux, A. Noury, W. Zhang, N. Izard, E. Duran, C. Alonso-Ramos, E. Cassan, L. Vivien.
Carbon nanotubes for efficient emission at telecom wavelengths on silicon photonic structures.
EMRS Spring Meeting 2015 (European Material Research Society Conference).
Lille (France), Grand Palais, 11 – 15 May 2015.

5 **F. Biccari***, G. Fiaschi, F. Sarti, A. Vinattieri, M. Gurioli, S. Birindelli, M. Felici, G. Pettinari, A. Gerardino, R. Trotta, A. Polimeni, M. Capizzi.
Optical characterization of site-controlled quantum dots obtained by hydrogenation of Ga(AsN)/GaAs quantum wells.
EMRS Spring Meeting 2015 (European Material Research Society Conference).
Lille (France), Grand Palais, 11 – 15 May 2015.

4 **F. Biccari***, C. Malerba, M. Valentini, R. Chierchia, Mittiga, C. L. Azanza Ricardo, P. Scardi.
Tin concentration effect on CZTS solar cells.
PVTC 2012 (PhotoVoltaic Technical Conference).
Aix-en-Provence (France), Centre de Congrès, 6 – 8 June 2012.

3 M. Valentini, C. Malerba, **F. Biccari***, R. Chierchia, P. Mangiapane, E. Salza, A. Mittiga.
Growth and characterization of Cu_2ZnSnS_4 thin films prepared by sulfurization of evaporated precursors.
EU PVSEC 2011 (European Photovoltaic Solar Energy Conference).
Hamburg (Germany), Messeplatz, 5 – 9 September 2011.
Note: See paper n. 5.

2 **F. Biccari***, C. Malerba, A. Mittiga.
Impurity effects in Cu_2O.
EMRS Spring Meeting 2010 (European Material Research Society Conference).
Strasbourg (France), Palais des Congres et de la Musique, 7 – 11 June 2010.
Note: See paper n. 11.

1 **F. Biccari***, C. Malerba, A. Mittiga.
Chlorine doping of Cu_2O.
EMRS Spring Meeting 2009 (European Material Research Society Conference).
Strasbourg (France), Palais des Congres et de la Musique, 8 – 12 June 2009.
Note: The conference paper has been selected as one of the best and it was awarded with the publication in the Elsevier journal Solar Energy Materials & Solar Cells (see paper n. 3).

Attachment 4: Scientific collaborations

F. Biccari currently works in the Nanostructures and Nanophotonics group of the Dept. of Physics and Astronomy of the University of Florence (since 2013) and previously he worked in the Photovoltaic group of the ENEA Casaccia Research Center from 2008 to 2013 under the supervision of Dr. A. Mittiga. He is also associated to the European Laboratory for Non-Linear Spectroscopy (LENS), where he manages the micro-photoluminescence laboratory. These groups have many national and international collaborations. In particular F. Biccari actively collaborated with:

- Prof. M. Capizzi, Prof. A. Polimeni and Dr. M. Felici (Sapienza – University of Rome, Italy). Optical characterization of nanostructures and photonic crystal cavities; hydrogenation of materials.
- Dr. A. Gerardino and Dr. G. Pettinari (CNR-IFN, Rome, Italy). Growth of dilute nitrides, EBL lithography, fabrication of photonic crystals and photonic crystal cavities.
- Prof. M. Abbarchi (University of Marseille, France). Growth of nanostructures.
- Prof. S. Sanguinetti (University Milano Bicocca, Italy). Growth of III-V nanostructures. This collaboration is carried out within the European Project 4PHOTON (Novel Quantum Emitters monolithically grown on Si, Ge and III-V substrates. ITN-ETN Horizon 2020 program, from 1 Jan 2017).
- Prof. E. Cassan (Paris Sud University, France) and Dr. L. Vivien (CNRS, France). Growth and deposition of carbon nanotubes and their integration in photonic circuits. This collaboration is carried out within the European Project CARTOON (CARbon nanoTube phOtONic devices on silicon. FET, 7th framework programme, 2013–2016).
- Prof. A. Kuznetsov (University of Oslo, Norway). Composition analysis of materials by SIMS.
- Prof. A. Di Carlo (University of Rome Tor Vergata, Italy). Growth and characterization of perovskites and perovskites based solar cells.
- Prof. A. Weber-Bargioni (The Molecular Foundry of Lawrence Berkeley National Laboratory, USA). Growth and optical characterization of perovskites for laser-applications.
- Prof. H. Mohseni (Department of Physics and Astronomy, Northwestern University, Chicago, USA). Dielectric microspheres and photonic jets for super-resolution microscopy.
- Prof. P. Scardi (Dept. of Civil, Environmental and Mechanical Engineering, University of Trento, Italy). High resolution XRD measurements and their modeling; deposition and doping of oxide semiconductors by sputtering. This partnership was carried out also with the collaboration of Dr. M. Müller, a researcher from the Max Planck Institute for Solid State Research (Stuttgart, Germany).
- Dr. A. Santoni (ENEA Frascati Research Center, Rome, Italy). X-ray Photoelectron Spectroscopy (XPS) measurements and their modeling.
- Dr. E. Esposito (ENEA Portici Research Center, Naples, Italy). Photothermal Deflection Spectroscopy (PDS).