europass Curriculum vitae

PERSONAL INFORMATION

Elena Blundo

Nationality Italian

CV APPLIED FOR Tutorship activity

EDUCATION

Nov 2019 – Present

PhD student in Physics

Sapienza, University of Rome

PhD student at the *Optical Spectroscopy of Nanostructured Materials laboratory* under the supervision of Prof. Antonio Polimeni.

The candidate research activity is focused on the study of the opto-electronic and mechanical properties of two-dimensional crystals. The candidate is currently investigating the effects of external perturbations in these systems, such as: hydrogen-irradiation, strain, magnetic fields.

Sep 2017 – Mar 2019

Master's Degree in Physics

Sapienza, University of Rome

Thesis: *Electronic properties of two-dimensional crystals under strain fields*, under the supervision of Prof. Antonio Polimeni.

Mark: 110/110 cum laude

The candidate accomplished her Master's Degree in 1 year and a half, in advance with respect to the 2-years legal duration.

Sep 2014 – Oct 2017

Bachelor's Degree in Physics

Sapienza, University of Rome

Thesis: *Mechanical deformations of two-dimensional materials*, under the supervision of Prof. Antonio Polimeni.

Mark: 110/110 cum laude

The candidate also accomplished the **Path of excellence of the Bachelor in Physics.**

a.y. 2013/2014

Scientific high school diploma

Liceo Scientifico Ettore Majorana, Rome

Mark: 100/100 cum laude

TEACHING AND TUTORSHIPS

a.y. 2020/21, II semester

Tutorship activity

Physics Department of Sapienza, University of Rome

80 hours of tutorship activity in Bachelor's degree courses during the academic year 2020/2021. The candidate was a teaching assistant for the Mechanics Laboratory Course, helping in the preparation of the laboratory experiences and helping students prepare for the exam.

a.y. 2019/20, II semester

Tutorship activity

Physics Department of Sapienza, University of Rome

40 hours of tutorship activity in Bachelor's degree courses during the academic year 2019/2020. The candidate was a teaching assistant for the Mechanics Laboratory Course, helping in the preparation of the laboratory experiences and helping students prepare for the exam.

a.y. 2018/19, I semester

Tutorship activity

Physics Department of Sapienza, University of Rome

40 hours of tutorship activity concerning *support activities for Italian students attending courses in English, and having difficulties in the comprehension of the English language*.

SUPERVISING

Supervisor activity

Physics Department of Sapienza, University of Rome

The candidate was co-supervisor of several Master's students:

a.y. 2020/2021 Co-supervisor of the Master's Degree student Marzia Cuccu. Thesis: *Fabrication and optical spectroscopy of two-dimensional van der Waals heterostructures*. Mark 110/110 cum laude.

a.y. 2020/2021 Co-supervisor of the Master's Degree student Salvatore Cianci. Thesis: *Effects of h-BN capping of two-dimensional crystals*. To be defended.

a.y. 2020/2021 Co-supervisor of the Master's students Giorgio Contestabile and Federico Tuzi within the Physics Laboratory II course.

ABROAD EXPERIENCES

Oct – Nov 2019

High Field Magnet Laboratory

During her first year as a PhD student, the candidate spent 2 weeks at the High Field Magnet Laboratory (HFML, in Nijmegen, The Netherlands). The HFML is an international facility which uses and develops high magnetic fields to carry out pioneering scientific research by in-house and external users. Fields up to 37.5 T are currently available there. The candidate performed magneto-optical measurements under high magnetic fields in semiconductor nanostructures.

GRANTS AND FUNDING

2021, First Call (May)

Research Project (role: PI)

European Magnetic Field Laboratory (EMFL), ISABEL project

Magnet time at the University of Warsaw, Poland, under the proposal *Strain tuning of the spin/valley physics of k-space direct and indirect excitons in transition-metal dichalcogenides* (ref. number NSC01-121) presented by the candidate. The proposal was approved by the EMFL and the experiment was performed in September 2021.

a.y. 2019/20

Funding (role: PI)

Sapienza, University of Rome

Avvio alla Ricerca Tipo I 2020, € 1600.

Nov 2019 – Oct 2020

Research Associate position

Sapienza, University of Rome; funding from Regione Lazio, Sinfonia Project

One-year Research Associate position for the *Realisation and characterisation of quantum dots and optical circuits on semiconductors*.

2018, First Call (May)

Research Project (role: participant)

European Magnetic Field Laboratory (EMFL)

Magnet time at the High Field Magnet Laboratory (HFML) in Nijmegen, The Netherlands, under the proposal *Probing the direct/indirect band gap structure of mechanically deformed WS2 single layers* (ref. number NSC10-118). The proposal was approved by the EMFL and the experiment was performed in October-November 2019.

AWARDS AND CONTESTS

2021 Prize "Michele Cantone" for *young graduated students* by the Italian Physical Society.

2020 Communication selected among the *Best Communications* at the 106° national conference by the Italian Physical Society.

2019 First prize for the *Best oral communication* at the 105° national conference (Physics of Matter section) by the Italian Physical Society.

a.y. 2019/20 Winner and ranked 1st in the contest for the PhD in Physics.

a.y. 2019/20 Winner and ranked 1st in the contest for the PhD in Mathematical Models for Engineering, Electromagnetics and Nanosciences.

REVIEW ACTIVITY

The candidate is a referee for the APS journals (Physical Review B and Physical Review Materials).

ATHLETIC CAREER

The candidate is also a Taekwondo Poomsae and Freestyle athlete, III dan. The candidate has been an International player of the National Team Italy since 2010 and has conquered numerous medals at European and World competitions (the palmares will be shown below). She is also a coach and national referee. She is the *regional coach of the Poomsae and Freestyle team* and she was elected *athlete representative* for the Lazio region.

PERSONAL SKILLS

Mother tongue: Italian

Other languages

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

Communication skills

- *team work*: The candidate has worked in various types of teams. In the research field, she had the possibility to collaborate with many other research groups. In sport, her activity concerns both individual and group practice.
- *communication experience*: The candidate was involved in several projects on the interplay between sport and education. In particular, for 2 years the CONI (the Italian Olympic Committee) made her join the project *Champions in life and sport*. Within this project, the candidate shared her experience in life and sport with young students (10-14 years) in secondary schools to promote sport values and highlight the importance of education.

Computer skills

- competent with most Microsoft Office programs and with LateX
- programming experience in the c language

RESEARCH TRACK RECORD

The candidate is author of 15 peer-reviewed papers (including 3 invited articles).

h factor: 6 (Scholar), 4 (WoS), 4 (Scopus).

Citations: 122 (Scholar), 84 (WoS), 91 (Scopus).

PUBLICATIONS

1. Davide Tedeschi†, Elena Blundo†, Marco Felici, Giorgio Pettinari, Boqing Liu, Tanju Yildirim, Elisa Petroni, Chris Zhang, Yi Zhu, Simona Sennato, Yuerui Lu, and Antonio Polimeni

   † co-first authors

   Controlled micro/nano-dome formation in proton-irradiated bulk transition-metal dichalcogenides

   Advanced Materials **31**, 1903795 (2019).

2. Elena Blundo, Marco Felici, Tanju Yildirim, Giorgio Pettinari, Davide Tedeschi, Antonio Miriametro, Boqing Liu, Wendi Ma, Yuerui Lu, and Antonio Polimeni
   Evidence of the direct-to-indirect band gap transition in strained two-dimensional WS_2, MoS_2, and WSe_2
   Physical Review Research **2**, 012024 (2020). Rapid Communication.

3. James Felton, Elena Blundo, Sanliang Ling, Joseph Glover, Zakhar R. Kudrynskyi, Oleg Makarovsky, Zakhar D. Kovalyuk, Elena Besley, Gavin Walker, Antonio Polimeni, and Amalia Patanè
   The Interaction of Hydrogen with the van der Waals Crystal γ-InSe
   Molecules **25**, 2526 (2020).

4. Elena Blundo*, Cinzia Di Giorgio, Giorgio Pettinari, Tanju Yildirim, Marco Felici, Yuerui Lu, Fabrizio Bobba, and Antonio Polimeni*
   * co-corresponding authors
   Engineered creation of periodic giant, non-uniform strains in MoS_2 monolayers
   Advanced Materials Interfaces **7**, 2000621 (2020).

5. Davide Tedeschi, H. Aruni Fonseka, Elena Blundo, Andrés Granados del Aguila, Yanan Guo, Hark H Tan, Peter CM Christianen, Chennupati Jagadish, Antonio Polimeni, and Marta De Luca
   Hole and Electron Effective Masses in Single InP Nanowires with a Wurtzite-Zincblende Homojunction
   ACS Nano **14**, 11613 (2020).

6. Elena Blundo
   Proton-induced straining of two-dimensional crystals
   Il Nuovo Cimento C **43**, 112 (2020), Invited paper.

7. Cinzia Di Giorgio, Elena Blundo, Giorgio Pettinari, Marco Felici, Yuerui Lu, Anna Maria Cucolo, Antonio Polimeni, and Fabrizio Bobba
   Nano-scale measurements of elastic properties and hydrostatic pressure in H_2-bulged MoS_2 membranes
   Advanced Materials Interfaces **7**, 2001024 (2020).

8. Mahmoud M. S. Abdelnabi, Elena Blundo, Maria Grazia Betti, Gianluca Cavoto, Ernesto Placidi, Antonio Polimeni, Alessandro Ruocco, Kailong Hu, Yoshikazu Ito, and Carlo Mariani
   Towards Free-Standing Graphane: Atomic Hydrogen and Deuterium Bonding to Nano-Porous Graphene
   Nanotechnology **32**, 035707 (2021).

9. Mahmoud M. S. Abdelnabi, Chiara Izzo, Elena Blundo, Maria Grazia Betti, Marco Sbroscia, Giulia Di Bella, Gianluca Cavoto, Antonio Polimeni, Isabel Garcia-Cortes, Isabel Rucandio, Alejandro Moroño, Kailong Hu, Yoshikazu Ito, and Carlo Mariani
   Deuterium Adsorption on Free-Standing Graphene
   Nanomaterials **11**, 130 (2021).

10. Elena Blundo, Emmanuele Cappelluti, Marco Felici, Giorgio Pettinari and Antonio Polimeni
    Strain-tuning of the electronic, optical, and vibrational properties of two-dimensional crystals
    Applied Physics Reviews **8**, 021318 (2021). Invited paper.

11. Elena Blundo, Antonio Polimeni, Daniele Meggiolaro, Andrea D'Annibale, Lorenza Romagnoli, Marco Felici, and Alessandro Latini
    Brightly Luminescent and Moisture Tolerant Phenyl-Viologen Lead Iodide Perovskites for Light Emission Applications
    The Journal of Physical Chemistry Letters **12**, 5456 (2021).

12. Elena Blundo*, Tanju Yildirim, Giorgio Pettinari, and Antonio Polimeni*
    * co-corresponding authors
    Experimental Adhesion energy in van der Waals crystals and heterostructures from atomically-thin bubbles
    Physical Review Letters **127**, 046101 (2021).

13. Elena Blundo*, Cinzia Di Giorgio, and Giorgio Pettinari
    * corresponding author
    Bubble formation in van der Waals crystals: A platform for fundamental studies
    Il Nuovo Cimento C **44**, 1 (2021), Invited Paper.

14. Cinzia Di Giorgio, Elena Blundo, Giorgio Pettinari, Marco Felici, Antonio Polimeni, and Fabrizio Bobba
    Exceptional elasticity of micro-scale constrained MoS_2 domes
    ACS Applied Materials and Interfaces, DOI: 10.1021/acsami.1c13293

15. Francesco Filippone, Saeed Younis, Giuseppe Mattioli, Marco Felici, Elena Blundo, Antonio Polimeni, Giorgio Pettinari, Damiano Giubertoni, Eduard Sterzer, Kerstin Volz, Dan Fekete, Alok Rudra, Eli Kapon, and Aldo Amore Bonapasta
    Selective effects of the host matrix in hydrogenated InGaAsN alloys: a new defect engineering paradigm.
    Advanced Functional Materials, in press.

SUBMITTED WORKS

1. Diego Di Girolamo, Elena Blundo, Giulia Folpini, Corinna Ponti, Guixiang Li, Mahmoud Aldamasy, Zafar Iqbal, Jorge Pascual, Giuseppe Nasti, Meng Li, Roberto Avolio, Alessandro Latini, Marco Felici, Annamaria Petrozza, Antonio Polimeni, and Antonio Abate
   Energy distribution in tin halide perovskite
   Under review.

ORAL PRESENTATIONS AT NATIONAL/INTERNATIONAL CONFERENCES

The first name is the name of the presenting author.

1. Antonio Polimeni, Davide Tedeschi, Elisa Petroni, Marco Felici, Giorgio Pettinari, Elena Blundo, Simona Sennato, Chris Zhang, Yuerui Lu
   Proton-driven generation of atomically thin, light emitting domes in transition metal dichalcogenides
   Invited speaker at the Psi-k workshop on 2D layered materials for opto-electronics: a theoretical/computational perspective, $18-19$ December 2017, Roma, Italy.

2. Antonio Polimeni, Davide Tedeschi, Marco Felici, Giorgio Pettinari, Elena Blundo, Elisa Petroni, Simona Sennato, Chris Zhang, Yuerui Lu
   Proton-driven patterning of bulk transition metal dichalcogenides
   Invited speaker at the International Workshop on Electronic Structure of Superconductors and Novel Materials, $23-25$ May 2018, Roma, Italy.

3. Elena Blundo, Davide Tedeschi, Marco Felici, Giorgio Pettinari, Simona Sennato, Elisa Petroni, Tanju Yildirim, Chris Zhang, Ankur Sharma, Boqing Liu, Yuerui Lu, Antonio Polimeni
   Hydrogen-driven generation of atomically thin, light emitting domes in transition metal dichalcogenides
   Materials 2018, $22-26$ October 2018, Bologna, Italy.

4. Marco Felici, Davide Tedeschi, Elena Blundo, Giorgio Pettinari, Tanju Yildirim, Elisa Petroni, Simona Sennato, Boqing Liu, Chris Zhang, Yi Zhu, Yuerui Lu, Antonio Polimeni
   Hydrogen-assisted fabrication of site-controlled light-emitting micro/nanodomes in bulk transition-metal dichalcogenides
   Invited speaker at the 6^{th} international workshop on Engineering of Quantum Emitter Properties, $5-7$ December 2018, Roma, Italy.

5. Cinzia Di Giorgio, Elena Blundo, Giorgio Pettinari, Davide Tedeschi, Marco Felici, Antonio Polimeni, Boqing Liu, Tanju Yildirim, Yuerui Lu, Fabrizio Bobba
   Elasto-mechanical study of MoS_2 domes by Atomic Force Microscopy and Spectroscopy
   NANO-M&D 2019, 4-8 June 2019, Paestum, Italy.
6. Antonio Polimeni, Elena Blundo, Davide Tedeschi, Marco Felici, Giorgio Pettinari, Boqing Liu, Tanju Yildirim, Elisa Petroni, Chris Zhang, Yi Zhu, Simona Sennato, Yuerui Lu
   Controlled micro/nano-dome formation in proton-irradiated bulk transition-metal dichalcogenides
   Invited speaker at the International Conference On Physics of 2D Crystals 2019, 11-15 June 2019, Hangzhou, China.
7. Elena Blundo, Davide Tedeschi, Marco Felici, Giorgio Pettinari, Boqing Liu, Tanju Yildirim, Chris Zhang, Yi Zhu, Yuerui Lu, Antonio Polimeni
   Controllable micro/nano-dome creation in proton-irradiated bulk transition-metal dichalcogenides
   Nanoinnovation 2019, 12-14 June 2019, Rome, Italy.
8. Elena Blundo, Davide Tedeschi, Marco Felici, Giorgio Pettinari, Boqing Liu, Tanju Yildirim, Chris Zhang, Yuerui Lu, Antonio Polimeni
   Proton-induced straining of two-dimensional crystals
   105° Congresso Nazionale SIF, 23-27 September 2019, L'Aquila, Italy.
9. Elena Blundo, Cinzia Di Giorgio, Marco Felici, Giorgio Pettinari, Tanju Yildirim, Yuerui Lu, Fabrizio Bobba, Antonio Polimeni
   Bubble formation in van der Waals crystals: A platform for fundamental studies.
   106° Congresso Nazionale SIF, 14-18 September 2020, Online conference.
10. Elena Blundo, Marzia Cuccu, Giorgio Pettinari, Cinzia Di Giorgio, Tanju Yildirim, Paulo E. Faria Junior, Marco Felici, Fabrizio Bobba, Antonio Polimeni
    Strain Tuning of the Optoelectronic Properties of Two-Dimensional Crystals.
    MRS 2021 Virtual Spring Meeting & Exhibit, 17-23 April 2021, Online conference.
11. Elena Blundo, Marzia Cuccu, Giorgio Pettinari, Salvatore Cianci, Atanu Patra, Marco Felici, Antonio Polimeni
    Tuning the optoelectronic properties of van der Waals heterostructures.
    107° Congresso Nazionale SIF, 13-17 September 2021, Online conference.

POSTERS AT NATIONAL/INTERNATIONAL CONFERENCES

The first name is the name of the presenting author.

1. Davide Tedeschi, Marco Felici, Giorgio Pettinari, Elena Blundo, Simona Sennato, Elisa Petroni, Tanju Yildirim, Chris Zhang, Ankur Sharma, Boqing Liu, Yuerui Lu, Antonio Polimeni
   Hydrogen-driven generation of atomically thin, light emitting domes in transition metal dichalcogenides
   Nonlinear optics and excitation kinetics in semiconductors, November 2018, Berlin, Germany.
2. Nicoletta Granchi, Elena Blundo, Davide Tedeschi, Marco Felici, Giorgio Pettinari, Tanju Yildirim, Boqing Liu, Chris Zhang, Yi Zhu, Yuerui Lu, Dario Balestri, Massimo Gurioli, Francesca Intonti, Antonio Polimeni
   Near-Field imaging of local light emission in transition metal dichalcogenides curved monolayers
   Plasmonica 2019, 19-21 June 2019, Naples, Italy.

SPORT AWARDS

7 Bronze medals of Sports Merit by CONI (the Italian Olympic Committee), in 2011, 2013, 2014, 2015, 2017, 2018, 2019

TAEKWONDO PALMARES

World Championships

- **1 Silver medal** World Championships 2012 in Tunja, Colombia.
- **1 Silver medal and 1 Bronze medal** Beach World Championships 2018 in Rhodes, Greece.

Grand Prix

- **1 Silver medal and 1 Bronze medal** Roma World Taekwondo Grand Prix 2019 in Rome.

European Championships

- **1 Silver medal and 1 Bronze medal** European Championships 2011 in Genoa, Italy.
- **1 Bronze medal** European Championships 2013 in Alicante, Spain.
- **1 Bronze medal** European Championships 2015 in Belgrade, Serbia.
- **1 Gold medal and 2 Silver medals** Europe Beach Championships 2019 in Antalya, Turkey.

Opens

- **2 Gold medals** Korean Open 2010 in Gumi.
- **1 Gold medal and 1 Silver medal** Austrian Open 2012 in Vienna.
- **1 Bronze medal** French Open 2016 in Lille.
- **1 Silver medal and 1 Bronze medal** Belgian Open 2018 in Lommel.
- **1 Bronze medal** Austrian Open 2020 in Vienna.

National championships

- **9 times National Poomsae Champion (Gold medal)** National Championships 2008, 2009, 2010, 2011, 2012, 2014, 2017, 2018, 2019.
- **1 time National Freestyle Champion (Gold medal)** National Championships 2017.