**Curriculum Vitae et Studiorum**

* **Personal Information**

Name: Francesca Urban Birth: 01/08/1992, Salerno (Italy)

Gender: F

* **Education and Research Experience**

06/02/2023 – 06/02/2033 **Italian** **Qualification as Associate Professor** – Condensed Matter Physics/Materials Science

12/02/2024 – to date **Postdoctoral Fellow** at Drexel University (Drexel Nanomaterials Institute) Supervisor: Prof. Yury Gogotsi

***Research topic***: Device fabrication, chemical functionalization and characterization of MXenes.

01/10/2023 – 30/01/2024 **Postdoctoral Fellow** at the Institut de Science et d’Ingénierie Supramoléculaires (ISIS), Université de Strasbourg & CNRS, France. Supervisor: Prof. Paolo Samorì

***Research topic***: Device fabrication, chemical functionalization and characterization of 2D materials

01/10/2020 – 30/09/2023 **Postdoctoral Marie Skłodowska-Curie Actions Fellow** at the Institut de Science et d’Ingénierie Supramoléculaires (ISIS), Université de Strasbourg & CNRS, France. Supervisor: Prof. Paolo Samorì

***Research topic***: Device fabrication, chemical functionalization and characterization of 2D materials

15/02/2023 – 09/03/2023 **Visiting Researcher** at Technische Universität Dresden, Dresden, Germany

***Research topic***: Study of TMDs defectivity for H2S sensing applications

01/05/2022 – 15/05/2022 **Visiting Researcher** at A.P.E Research, Trieste, Italy

***Research topic***: AFM characterizations

10/2018 – 12/2018 **Visiting PhD Student** at Trinity College Dublin, Dublin, Ireland. Supervisor: Prof. Niall McEvoy

***Research topic***: Chemical vapor deposition of 2D TMDs, structural characterization and device fabrication

04/10/2017 – 22/01/2021 **PhD** in Mathematics, Physics and Applications at the University of Salerno, Italy. Supervisor: Prof. Antonio Di Bartolomeo

***Research topic***: Electrical characterization of 2D materials for optoelectronic applications

**Score: Excellent**

08/01/2016 – 20/09/2017 **Master of Science** in Physics at the University of Salerno, Italy

Score: 110/110 cum laude

***Research topic***: Superconductivity and proximity effect

* **Peer-Reviewed Publications**

Bibliometrics: Author of 42 papers in peer-reviewed journals, including 6 first-author papers. *h*-index: 20. Total citations: 1,440+ (source: *Google Scholar*).

* **Presentations in International Conferences and International Advanced Schools**

**2023**

1. NMDC 2023, Oral contribution, 22–25/10/2023, Paestum, Italy
2. “MRS Spring 2023”, Oral contribution, section EL09 Layered (2D) Optoelectronic Materials and Devices, 11/04/2023, San Francisco, USA

**2021**

1. “Chem2DMat – European Conference on chemistry of 2D materials”, 31/08–03/09/2021, Oral contribution, Genova, Italy

**2020**

1. ULTIMATE – 1st School “Self-Assembly on Surfaces and 2D Reactivity”, 16–18/09/2020, Online conference

**2019**

1. “Nano M&D”, Poster session, 04–07/06/2019, Paestum, Italy

**2018**

1. Workshop, Oral contribution, 20/12/2018, Dublin, Ireland
2. “Nanoapplication Workshop”, Oral contribution, 19–22/09/2018, Munich, Germany
3. “International School E. Fermi: Nanoscale Quantum Optics”, Poster session, 22–28/07/2018, Varenna, Italy
4. “Young Researcher Meeting”, Oral contribution, 10–13/07/2018, Salerno, Italy

* **Organization of International Conferences**

1. Special Session Organizer: 2D Printable Electronics at “NMDC 2023”, Paestum, 22–25/10/2023
2. Award Committee: “NMDC 2023”, Paestum, 22–25/10/2023
3. Local Organization Committee: “Nano M&D”, Paestum, 04–07/06/2019

* **Chairman in International Conferences and International Advanced Schools**

1. “Optoelectronic and Energy Applications of 2D Materials”, 25–27/01/2022

* **Awards**

1. Winner of Erasmus scholarship, Tyndall National Institute (Prof. Paul Hurley), Cork, Ireland, 2020
2. Winner of the Start Cup Campania 2018 with the project “GRADI’” (a study on the properties of carbon-based devices), submitted as Italian patent “Carbon Nanotube Sensors for Alcoholic Graduation” (N° 01089441 del 06/09/2018, Inventors: A. Di Bartolomeo, L. Iemmo, N. Martucciello, F. Giubileo, C. Giordano, S. Abate, G. Luongo, **F. Urban**, A. Barbarisi)
3. Winner of “Best Article – Young SPIN” 2018 for the paper “Transport and Field Emission Properties of MoS2 Bilayers”, **F. Urban**, M. Passacantando, F. Giubileo, L. Iemmo, A. Di Bartolomeo, *Nanomaterials* **2018**, *8*, 151
4. Winner of the prize “Best Practice 2018”

* **Industrial Innovation and Patents**

1. Winner of the Start Cup Campania 2018 with the project “GRADI’” (a study on the properties of carbon-based devices)

2. Inventor of the Italian patent “Carbon Nanotube Sensors for Alcoholic Graduation” (N° 01089441 del 06/09/2018, Inventors: A. Di Bartolomeo, L. Iemmo, N. Martucciello, F. Giubileo, C. Giordano, S. Abate, G. Luongo, **F. Urban**, A. Barbarisi)

* **Teaching and Mentoring Activities**
* **2021** Teacher at the Summer School “STEM Academy”, 30/08–03/09/2021, Class “Semiconductor, nanoelectronics and devices”
* **2019/2020** Teaching Assistant for the course *Physics laboratory 3*, Physics Department, University of Salerno
* **2018/2019** Teaching Assistant for the courses *Condensed matter* physics, Physics *1*, *Physics 2* and *Physics laboratory 3*, Chemistry Department, University of Salerno
* **2017/2018** Teaching Assistant for the course *Introduction to mathematics and physics*, Physics Department, University of Salerno
* Supervision of bachelor, master, and PhD students
* **Editorial Board and Special Issues**

1. Special Issue of *Nanomaterials* (MDPI): “Two-Dimensional Materials For (Opto)-Electronic Applications”
2. Special Issue of *Nano Express* (IOP): “2D Printable Electronics”

* **Peer Reviewer**

1. Nature
2. Advanced Electronic Materials
3. Physica Status Solidi
4. Micro & Nano Letters
5. Materials Today: Proceedings
6. Journal of Electron Spectroscopy and Related Phenomena
7. IEEE Transactions on Nanotechnology
8. Nanomaterials
9. Crystals
10. Superlattices and Microstructures

* **Skills**
* Microfabrication: chemical vapor deposition (CVD), sputtering, evaporation, photolithography, e-beam lithography, etching procedure, dry transfer, wet transfer
* Characterization techniques: atomic force microscopy, surface profilometer, Raman spectroscopy, photoluminescence spectroscopy, UV/Vis spectroscopy, semiconductor parameter analyzer, electrical measurements, cryogenic measurements techniques
* Computational skills: Mathematica, C++ and LabVIEW
* Graphic programs: Blender
* Languages: Italian (native), English (fluent), French (intermediate)

**References:**

* ***Prof. Paolo Samorì****,* Institut de Science et d’Ingénierie Supramoléculaires (ISIS), Université de Strasbourg & CNRS, France ([samori@unistra.fr](mailto:samori@unistra.fr))
* ***Prof. Antonio Di Bartolomeo****,* University of Salerno, Italy ([adibartolomeo@unisa.it](mailto:adibartolomeo@unisa.it))
* ***Prof. Carmine Attanasio***, University of Salerno, Italy ([cattanasio@unisa.it](mailto:cattanasio@unisa.it) )
* ***Prof. Gianaurelio Cuniberti****,* Technische Universität Dresden, Germany ([gianaurelio.cuniberti@tu-dresden.de](mailto:gianaurelio.cuniberti@tu-dresden.de))

**Publication List**

1. S. Ippolito, **F. Urban**, W. Zheng, O. Mazzarisi, C. Valentini, A. G Kelly, S. Manoj Gali, M. Bonn, David Beljonne, F. Corberi, J. N Coleman, H. I Wang, P. Samorì, “Unveiling Charge Transport Mechanisms in Electronic Devices based on Defect‐engineered MoS2 Covalent Networks”, *Adv. Mater*, **2023**, 2211157
2. I. Janica, V. Montes-García, **F. Urban**, P. Hashemi, A. Shaygan Nia, X. Feng, P. Samorì, A. Ciesielski, "Covalently Functionalized MXenes for Highly Sensitive Humidity Sensors", *Small Methods*, **2023**, 2201651.
3. C. Cirillo, A. Leo, **F Urban**, H. Bradshaw, E. Ponticorvo, M. Sarno, J.W.A. Robinson, A. Nigro, C. Attanasio, “Role of disorder in the superconducting proximity effect in a-NdNi5/Nb bilayers ”, *Physical Review B* **2021,** 21, 214509
4. Pelella, A. Grillo, **F. Urban**, F. Giubileo, M. Passacantando, E. Pollmann, S. Sleziona, M. Schleberger, A. Di Bartolomeo, “Gate-Controlled Field Emission Current from MoS2 Nanosheets”, *Adv. Electron. Mater*. **2021**, *7*, 2000838.
5. U. Coscia, A. Longo, M. Palomba, A. Sorrentino, G. Barucca, A. Di Bartolomeo, **F. Urban**, G. Ambrosone, G. Carotenuto, “Influence of the Thermomechanical Characteristics of Low-Density Polyethylene Substrates on the Thermoresistive Properties of Graphite Nanoplatelet Coatings”, *Coatings* **2021**, *11*, 332.
6. A. Di Bartolomeo, **F. Urban**, E. Faella, A. Grillo, A. Pelella, F. Giubileo, M. B. Askari, N. McEvoy, F. Gity, P. K. Hurley, “PtSe2 phototransistors with negative photoconductivity”, *J. Phys. Conf. Ser*. **2021**, *1866*, 012001.
7. **F. Urban**, F. Gity, P. K. Hurley, N. McEvoy, A. Di Bartolomeo, “Isotropic conduction and negative photoconduction in ultrathin PtSe2 films”, *Appl. Phys. Lett*. **2020**, *117*, 193102.
8. F. Giubileo, M. Passacantando, **F. Urban**, A. Grillo, L. Iemmo, A. Pelella, C. Goosney, R. LaPierre, A. Di Bartolomeo, “Field Emission Characteristics of InSb Patterned Nanowires”, *Adv. Electron. Mater*. **2020**, *6*, 2000402.
9. B. Cirillo, C. Barone, H. Bradshaw, **F. Urban**, A. Di Bernardo, C. Mauro, J. W. A. Robinson, S. Pagano, C. Attanasio, “Magnetotransport and magnetic properties of amorphous NdNi5 thin films”, *Sci. Rep*. **2020**, *10*, 13693.
10. A. Pelella, O. Kharsah, A. Grillo, **F. Urban**, M. Passacantando, F. Giubileo, L. Iemmo, S. Sleziona, E. Pollmann, L. Madauß, M. Schleberger, A. Di Bartolomeo, “Electron Irradiation of Metal Contacts in Monolayer MoS2 Field-Effect Transistors”, *ACS Appl. Mater. Interfaces* **2020**, *12*, 40532.
11. A. Di Bartolomeo, **F. Urban**, A. Pelella, A. Grillo, L. Iemmo, E. Faella, F. Giubileo, “Electrical transport in two-dimensional PdSe2 and Mos2 nanosheets”, in 2020 *IEEE 20th Int. Conf. Nanotechnol. IEEE-NANO*, IEEE, Montreal, QC, Canada, **2020**, pp. 276–281.
12. A. Di Bartolomeo, A. Pelella, **F. Urban**, A. Grillo, L. Iemmo, M. Passacantando, X. Liu, F. Giubileo, “Field Emission in Ultrathin PdSe2 Back-Gated Transistors”, *Adv. Electron. Mater*. **2020**, *6*, 2000094.
13. A. Di Bartolomeo, **F. Urban**, A. Pelella, A. Grillo, M. Passacantando, X. Liu, F. Giubileo, “Electron irradiation of multilayer *PdSe2* field effect transistors”, *Nanotechnology* **2020**, *31*, 375204.
14. **F. Urban**, G. Lupina, A. Grillo, N. Martucciello, A. Di Bartolomeo, “Contact resistance and mobility in back-gate graphene transistors”, *Nano Express* **2020**, *1*, 010001.
15. A. Grillo, A. Di Bartolomeo, **F. Urban**, M. Passacantando, J. M. Caridad, J. Sun, L. Camilli, “Observation of 2D Conduction in Ultrathin Germanium Arsenide Field-Effect Transistors”, *ACS Appl. Mater. Interfaces* **2020**, *12*, 12998.
16. E. Faella, **F. Urban**, A. Grillo, A. Pelella, F. Giubileo, A. Di Bartolomeo, “Sensors Based on Multiwalled Carbon Nanotubes”, *Mater. Proc*. **2020**, *4*, 59.
17. A. Longo, M. Palomba, **F. Urban**, A. Di Bartolomeo, A. Sorrentino, G. Barucca, G. Ambrosone, U. Coscia, G. Carotenuto, “Structural and Electrical Properties of Graphite Platelet Films Deposited on Low-Density Polyethylene Substrate”, *Mater. Proc*. **2020**, *4*, 38.
18. A. Pelella, A. Grillo, E. Faella, F. Giubileo, **F. Urban**, A. Di Bartolomeo, “Molybdenum Disulfide Field Effect Transistors under Electron Beam Irradiation and External Electric Fields”, *Mater. Proc*. **2020**, *4*, 25.
19. A. Grillo, E. Faella, F. Giubileo, A. Pelella, **F. Urban**, A. Di Bartolomeo, “Temperature Dependence of Germanium Arsenide Field-Effect Transistors Electrical Properties”, *Mater. Proc.* **2020**, *4*, 26.
20. F. Giubileo, **F. Urban**, A. Grillo, A. Pelella, E. Faella, A. Di Bartolomeo, “Direct Contacting of 2D Nanosheets by Metallic Nanoprobes”, *Mater. Proc.* **2020**, *4*, 16.
21. A. Di Bartolomeo, **F. Urban**, E. Faella, A. Grillo, A. Pelella, F. Giubileo, N. McEvoy, F. Gity, P. K. Hurley, “Electrical Conduction and Photoconduction in PtSe2 Ultrathin Films”, *Mater. Proc*. **2020**, *4*, 28.
22. A. Di Bartolomeo, A. Pelella, A. Grillo, **F. Urban**, F. Giubileo, “Air Pressure, Gas Exposure and Electron Beam Irradiation of 2D Transition Metal Dichalcogenides”, *Appl. Sci.* **2020**, *10*, 5840.
23. L. Iemmo, **F. Urban**, F. Giubileo, M. Passacantando, A. Di Bartolomeo, “Nanotip Contacts for Electric Transport and Field Emission Characterization of Ultrathin MoS2 Flakes”, *Nanomaterials* **2020**, *10*, 106.
24. A. Di Bartolomeo, L. Iemmo, **F. Urban**, M. Palomba, G. Carotenuto, A. Longo, A. Sorrentino, F. Giubileo, G. Barucca, M. Rovere, A. Tagliaferro, G. Ambrosone, U. Coscia, “Graphite platelet films deposited by spray technique on low density polyethylene substrates”, *Mater. Today Proc*. **2020**, *20*, 87.
25. G. Luongo, A. Grillo, **F. Urban**, F. Giubileo, A. Di Bartolomeo, “Effect of silicon doping on graphene/silicon Schottky photodiodes”, *Mater. Today Proc*. **2020**, *20*, 82.
26. F. Giubileo, A. Grillo, L. Iemmo, G. Luongo, **F. Urban**, M. Passacantando, A. Di Bartolomeo, “Environmental effects on transport properties of PdSe2 field effect transistors”, *Mater. Today Proc.* **2020**, *20*, 50.
27. A. Grillo, F. Giubileo, L. Iemmo, G. Luongo, **F. Urban**, M. Passacantando, A. Di Bartolomeo, “Field emission from mono and two-dimensional nanostructures”, *Mater. Today Proc*. **2020**, *20*, 64.
28. A. Di Bartolomeo, F. Giubileo, A. Grillo, G. Luongo, L. Iemmo, **F. Urban**, L. Lozzi, D. Capista, M. Nardone, M. Passacantando, “Bias Tunable Photocurrent in Metal-Insulator-Semiconductor Heterostructures with Photoresponse Enhanced by Carbon Nanotubes”, *Nanomaterials* **2019**, *9*, 1598.
29. **F. Urban**, F. Giubileo, A. Grillo, L. Iemmo, G. Luongo, M. Passacantando, T. Foller, L. Madauß, E. Pollmann, M. Geller, D. Oing, M. Schleberger, A. Di Bartolomeo, “Gas dependent hysteresis in MoS2 field effect transistors”, *2D Mater*. **2019,** *6*, 045049.
30. A. Di Bartolomeo, A. Pelella, X. Liu, F. Miao, M. Passacantando, F. Giubileo, A. Grillo, L. Iemmo, **F. Urban**, S.-J. Liang, “Pressure-Tunable Ambipolar Conduction and Hysteresis in Thin Palladium Diselenide Field Effect Transistors”, *Adv. Funct. Mater*. **2019**, *29*, 1902483.
31. A. Grillo, J. Barrat, Z. Galazka, M. Passacantando, F. Giubileo, L. Iemmo, G. Luongo, **F. Urban**, C. Dubourdieu, A. Di Bartolomeo, “High field-emission current density from β-Ga2O3 nanopillars”, *Appl. Phys. Lett*. **2019**, *114*, 193101.
32. A. Grillo, F. Giubileo, L. Iemmo, G. Luongo, **F. Urban**, A. Di Bartolomeo, “Space charge limited current and photoconductive effect in few-layer MoS2”, *J. Phys. Conf. Ser*. **2019**, *1226*, 012013.
33. **F. Urban**, M. Passacantando, F. Giubileo, L. Iemmo, G. Luongo, A. Grillo, A. Di Bartolomeo, “Two-dimensional effects in Fowler-Nordheim field emission from transition metal dichalcogenides”, *J. Phys. Conf. Ser.* **2019**, *1226*, 012018.
34. F. Giubileo, A. Grillo, M. Passacantando, **F. Urban**, L. Iemmo, G. Luongo, A. Pelella, M. Loveridge, L. Lozzi, A. Di Bartolomeo, “Field Emission Characterization of MoS2 Nanoflowers”, *Nanomaterials* **2019**, *9*, 717.
35. M. Palomba, G. Carotenuto, A. Longo, A. Sorrentino, A. Di Bartolomeo, L. Iemmo, **F. Urban**, F. Giubileo, G. Barucca, M. Rovere, A. Tagliaferro, G. Ambrosone, U. Coscia, “Thermoresistive Properties of Graphite Platelet Films Supported by Different Substrates”, *Materials* **2019**, *12*, 3638.
36. A. Di Bartolomeo, **F. Urban**, M. Passacantando, N. McEvoy, L. Peters, L. Iemmo, G. Luongo, F. Romeo, F. Giubileo, “A WSe2 vertical field emission transistor”, *Nanoscale* **2019**, *11*, 1538.
37. F. Giubileo, L. Iemmo, M. Passacantando, **F. Urban**, G. Luongo, L. Sun, G. Amato, E. Enrico, A. Di Bartolomeo, “Effect of Electron Irradiation on the Transport and Field Emission Properties of Few-Layer MoS2 Field-Effect Transistors”, *J. Phys. Chem. C* **2019**, *123*, 1454.
38. **F. Urban**, N. Martucciello, L. Peters, N. McEvoy, A. Di Bartolomeo, “Environmental Effects on the Electrical Characteristics of Back-Gated WSe2 Field-Effect Transistors”, *Nanomaterials* **2018**, 8, 901.
39. A. Di Bartolomeo, L. Iemmo, F. Giubileo, G. Luongo, **F. Urban**, A. Grillo, “Persistent Photoconductivity, Hysteresis and Field Emission in MoS2 Back-Gate Field-Effect Transistors”, in 2018 *IEEE 13th Nanotechnol. Mater. Devices Conf. NMDC*, IEEE, Portland, OR, USA, **2018**, pp. 1–2.
40. A. Di Bartolomeo, A. Grillo, **F. Urban**, L. Iemmo, F. Giubileo, G. Luongo, G. Amato, L. Croin, L. Sun, S.-J. Liang, L. K. Ang, “Asymmetric Schottky Contacts in Bilayer MoS2 Field Effect Transistors”, *Adv. Funct. Mater*. **2018**, *28*, 1800657.
41. F. Giubileo, A. Di Bartolomeo, L. Iemmo, G. Luongo, **F. Urban**, “Field Emission from Carbon Nanostructures”, *Appl. Sci*. **2018**, *8*, 526.
42. **F. Urban**, M. Passacantando, F. Giubileo, L. Iemmo, A. Di Bartolomeo, “Transport and Field Emission Properties of MoS2 Bilayers”, *Nanomaterials* **2018**, *8*, 151.