

## Curriculum vitae

### PERSONAL INFORMATION & TRACK RECORD

Surname, Name: **Grancini, Giulia**

Date of birth: **05/05/1984**; Nationality: **Italian**

Highly Cited Scientist for five years since 2019 Publons.

H index=53 (scopus); total number of citations >22000 (scopus). N. of scientific Publications: 150; 5 patents; one book chapter.

Researcher unique identifiers: ORCID ID: 0000-0001-8704-4222; Scopus ID:

6508101563; Researcher ID: K-9060-2013; Web of Science Researcher ID: AAH-3557-2019

web site: <https://pvsquared2.unipv.it/>



### EDUCATION

21/02/2012 **PhD cum laude in Physics**, Politecnico di Milano, Physics Department, Milano, Italy; PhD Supervisor: Prof. Guglielmo Lanzani

2008 Master Degree in Physical Engineering, Politecnico di Milano Milano, Italy

### CURRENT POSITIONS

07/2019 – now **Associate Professor, Chemistry Department, University of Pavia**, Pavia, Italy  
Head of the PVsquared2 team of 12 scientists, responsible for the PVsquared2 laboratories. *Principal Investigator (PI)* of the ERC StG 2018 “HYNANO”, ERC POC 2022 “Spike”, Fare Project “Express”, Fondazione Cariplo “Flhyper” and MITE “GOPV” for a total of 4.5M Euros to my name since 2019. **Mission:** advance in fundamental and applied science on hybrid perovskites materials and solar cells. **Output:** 37 scientific publications, 2 patents.

07/2022 – now **Associate Editor** of Chem Soc Rev IF=46.2

### PREVIOUS POSITIONS

05/2017 – 06/2019 **Team Leader, École Polytechnique Fédérale de Lausanne (EPFL)** Valais, Sion, Switzerland. **Mission:** *Principal Investigator* of the Ambizione Energy HYPER grant (740 kCHF), Responsible of a group of 2 PhD students and 2 Post docs. **Output:** 23 publications, 10 invited talks, 10 oral contributions to conferences.

09/2015 – 05/2017 **Scientist, École Polytechnique Fédérale de Lausanne (EPFL)** Valais, Sion, Switzerland with Prof. M. k. Nazeeruddin *EPFL COFUND Marie Skłodowska-Curie* (68 kCHF), **Mission:** Manager of optical spectroscopy lab on advanced perovskite solar cell. Responsible of a group of 2 PhD students and 1 Post doc. Co-PI of Project EPISODE (500K CHF) and of CTI project (760K CHF) **Output:** 10 publications, 1 book chapter, invited speaker at 7 international meetings.

01/2012 – 08/2015 **Post-Doc Researcher, Istituto Italiano di Tecnologia (IIT)**, under MESO European Project of Dr. Petrozza. **Mission:** Development of hybrid perovskites physics. Management of ultrafast spectroscopy lab and of 4 PhDs and 2 students. **Output:** 30 publications, invited speaker at 5 international conferences.

02/2013 – 04/2013 **Visiting Scientist, University of Utah, Salt Lake City**, Utah, USA in the group of Prof. V. Vardeny. **Mission:** development of a new ultrafast transient absorption setup in the IR spectral region. **Output:** Established collaboration.

08/2010 – 04/2011 **Visiting PhD Student, Oxford University**, Oxford, UK with Dr. Henry Snaith. **Mission:** fabrication and optoelectronic characterization of hybrid solar cells **Output:** ongoing collaboration; 3 publications and 2 patents.

### RESEARCH ACHIEVEMENTS AND PEER RECOGNITION

**Selected research achievements (I conceived the idea and lead the research as corresponding author)**

**1.** Zanetta, A.; Vishal, B.; Faini, F.; Pica, G.; Marras, S.; Yıldırım, B. K.; Babics, M.; Ugur, E.; Aydin, E.; De Wolf, S.; De Bastiani, M.; \***Grancini, G.** “Controlled Growth of the Inorganic Backbone in Low-Dimensional Perovskites for Efficient, Stable, Semi-Transparent Wide Bandgap Perovskite Solar Cells” 2023/7/12 *Research Square Platform LLC* – available online <https://doi.org/10.21203/rs.3.rs-2985134/v1>.

*In this work I demonstrate – for the first time- how to direct vertical orientation of LDP for the realization of world record efficient LDP based solar cells. The work appears online in a repository, and it is currently under*

review. Such preliminary results (explained with details in the project) will sustain the scientific and operational feasibility of ELOW-DI (it will support the realization in particular of WP1-WP4).

**2. A. Zanetta & G.Grancini**, Patent n. 102022000025854 (December 2022), Title "Process for inducing crystal orientation in low dimensional perovskites".

*The patent refers to the invention reported in 1., providing evidence of the novelty of the vertical aligned LDP as the concept itself behind material engineering, but also for the potential in its applications. An Italian company I work with has already shown interest in this patent, which is utmost for a timely transition from lab to fab.*

**3. G. Grancini**, Patent n. 102021000031412 (December 2021), Title: "Composite Material for solar cell".

*The patent refers to a novel class of nanosponges, as smart getters to be included in encapsulant. Perovskite solar cells durability is demonstrated. This patent is an output of my ERC POC Spike Project and it will serve as an in-house developed strategy to stabilize the perovskite devices realized in ELOW-DI project to ensure the realization of stable devices (Obj.1). It will support the realization of WP3 and 4.*

**4. Pietropaolo, A.; Mattoni, A.; Pica, G.; Fortino, M.; Schifino, G.; \*Grancini, G.** "Rationalizing the design and implementation of chiral hybrid perovskites" *Chem* **8**, 1–23 (2022); IF= 25.8, Cit=26.

*This work puts together recent strategies and results on engineering chiral perovskites. The work is a first output of the collaboration with theoretical groups within my PRIN project IMPACT (just started) and it will serve as a guideline for material selection in WP1.*

**5. Degani, M.; An, Q.; Albaladejo-Siguan, M.; Hofstetter, Y.J.; Cho, C.; Paulus, F.; \*Grancini, G.; Vaynzof, Y.** "23.7% Efficient inverted perovskite solar cells by dual interfacial modification" *Sci. Adv.* **7**, 1-10 (2021) IF=14.1 Cit=195.

*This work, I coordinated with Prof. Vaynzof group, where my PhD Degani spent a visiting research period (during Covid), demonstrates world record efficiency of pin perovskite solar cells using ligand passivation, one of the main outputs of my ERC StGrant HYNANO. Thanks to the knowledge developed, today, my group reaches 24.5% efficient and stable pin solar cells, a solid know-how which will support Obj. 1, 2.*

**6. Cacovich, S.; Vidon, G.; Degani, M.; Legrand, M.; Gouda, L.; Puel, J-B.; Vaynzof, Y.; Guillemoles, J-F.; Ory, D.; \*Grancini, G.** "Imaging and quantifying non-radiative losses at 23% efficient inverted perovskite solar cells interfaces" *Nat. Commun.* **13**, 1–9 (2022) IF= 16.6 Cit= 50.

*This work represents a milestone for the identification of the interface processes responsible for enhancing perovskite solar cells performances. Space-resolved optical studies of thin films and full device have been conducted to quantify losses and understand interface and device physics. The work is output of the research done in my ERCStGrant HYNANO and will support the scientific feasibility of ELOW-DI (WP2, WP3).*

**7. Zanetta, A.; Andaji-Garmaroudi, Z.; Pirola, V.; Pica, G.; Utama Kosasih, F.; Gouda, L.; Frohna, K.; Ducati, C.; Doria, F.; Stranks, S. D.; \* Grancini, G.** "Manipulating Color Emission in 2D Hybrid Perovskites by Fine Tuning Halide Segregation: A Transparent Green Emitter" *Adv. Mater.* **34**(1), 2105942 (2021) IF= 32 Cit=16.

*This work demonstrates a deep competence on how to manipulate LDPs by structural and compositional engineering, to obtain the desired function. In this case, my team has designed a LDP which is transparent to the human eyes, but it efficiently emits in the green, establishing a new class of LDPs. This work is an output of my ERC StGrant HYNANO and it will support the realization of WP1 and WP2.*

**8. Larini, V.; Ding, C.; Faini, F.; Pica, G.; Bruni, G.; Pancini, L.; Cavalli, S.; Manzi, M.; Degani, M.; Pallotta, R.; De Bastiani, M.; Ma, C.-Q.; \*Grancini, G.** "Sustainable and Circular Management of Perovskite Solar Cells via Green Recycling of Electron Transport Layer-Coated Transparent Conductive Oxide" *Adv. Funct. Mater.* <https://doi.org/10.1002/adfm.202306040> (2023) IF=19.9, Cit=16.

*This work demonstrates an innovative circular approach for the recycling of perovskite solar cells with innovative, but simple solution-based methods. This is the output of my Research Project FLHYPER (Fondazione Cariplo). This work set a defined recycling process in the lab. My team is now using recycled substrates and precursors to make highly efficient devices, reducing the material waste, and making the research more sustainable, which I believe is essential for the development of any future technologies.*

**9. M. De Bastiani, V. Larini, R. Montecucco, G. Grancini\*** "The leveled cost of electricity from perovskite photovoltaics" *Energy Environ. Sci.* **16**, 421-429 (2023) IF=32.5, Cit=17.

*This work presents an in-depth techno-economic analysis that evaluates the cost potential of perovskite solar technology. A comprehensive evaluation on lab-record devices compared to modules fabricated in industrial production lines enable to identify the key economic impact of device stability. This knowledge is crucial for a further exploitation of our perovskite solar cells into the market, ultimate goal of my research.*

10. R. Montecucco, G. Pica, V. Romano, F. De Boni, S. Cavalli, G. Bruni, E. Quadri, M. De Bastiani, M. Prato, R. Po, **G. Grancini\*** “The Stabilization of CsPbI<sub>3</sub>-xBr<sub>x</sub> Phase by Lowering Annealing Temperature for Efficient All-Inorganic Perovskite Solar Cells” *Sol. RRL* **7**, 1–10 (2023), IF=9.1, Cit=17  
*This work presents an innovative method to increase Cs-based perovskite solar cell efficiency reducing the processing temperature, key for flexible substrate. Large area modules are also realized. This know-how is key to support the scientific feasibility of WP4.*

## SELECTED PRIZES AND AWARDS

- The Second Nano Materials Science Award by Nanomaterials Science (2023)
- Rosa Camuna Award for Research 2023, Lombardy Region
- Special Honour from Italian Republic President Mattarella for Scientific Merits as “Cavaliere della Repubblica” (2021)
- Italian Abilitation for Full Professor obtained both in Chemistry and in Physics
- Journal of Materials Chemistry Lectureship from Royal Society of Chemistry (2020)
- Highly Cited Scientist for the last 5 years in a row since 2019 (ranking in the top 1% by citations for field and year) (cross field) – Clarivate Analytics
- USERN Laureate in Physical Science 2019, Budapest (2019).
- Swiss Physical Society Award 2018 in Applied Physics (2018)
- IUPAP Young Scientist Prize in Optics 2017 for “deep knowledge on photophysical properties and ultrafast light-induced dynamical processes” (2017)

## MEMBERSHIPS

- Member of “top 1% highly cited scientists” from Clarivate – mostly cited in the world (since 2019)
- Invited Fellow of the Royal Society of Chemistry (2023)
- Member Elected of “Accademia XL”, one of the ancient academies of top Italian scientists (2022)
- Invited Member of “Gruppo 2003 per la ricerca scientifica”, made of the top 1% highly cited scientist in Italy (2020)
- Vice-Chair Selection Committee Young Academy of Europe (2020-2021)
- Italian Ambassador USERN Universal Scientific Education and Research Network (since 2020)
- Member of “100 donne nella scienza contro gli stereotipi” Fondazione Bracco, Milano, selecting the most influential women scientists in Italy (since 2020).
- Member of the European consortium of research institutes working on perovskites (since 2019)
- Member of Board of the Young Academy of Europe (2019-2021)
- 2010-2012, 2015, 2017-2023 Member of the Materials Research Society (MRS)

## SELECTED PLENARY (8 since 2020) and INVITED TALKS (30 since 2020)

In my scientific research community, there are world-scale conferences which are the references for the community such as the Material Research Society (MRS) meetings, the international conference on perovskite solar cells and optoelectronics and the series of conferences from NanoGe community. **Since 2020 I have been invited to deliver 10 plenary and 30 invited talks.** Here a selection:

- Plenary MRS Session, Featured Invited Talk at MRS/The Kavli Foundation Frontiers of Materials “Hybrid Perovskite Solar Cells—A Game Changer for Near-Future Photovoltaics”, Boston, (2023)
- Two Invited Talks at EN05 and EN06 symposia, MRS Fall 2023 Boston (2023)
- Invited Talk at CMD30 FisMat 2023, Joint Conference of the Italian and European Community of Condensed Matter Physics, Milan (2023)
- Plenary Talk at The Second Nano Materials Science Award by Nanomaterials Science (2023)
- Invited Talk at the International Conference PSCO 23, Oxford (2023)
- Two Invited Talks at MRS Spring, online (2023)
- Invited Talk at MRS Fall 2022, online (2022)
- Invited Talk international conference nanoGe Spring Meeting 2022, Online (2022)
- Plenary Talk at 2D-HAPES2021, online (2021)
- Plenary Talk at 2021 Light Management in New Photovoltaic Materials (LMPV) at AMOLF (2021)
- Plenary Talk RSC Desktop Seminar Lectureship Series with Journal of Materials Chemistry A, B & C as winner of the Journal Material Chemistry Lectureship 2020 award (2021), online.
- Plenary Lecture at Centre for Innovation on New Energies, University of Campinas, online (2020).
- Plenary Lecture: USERN Congress and USERN Prize Awarding Festival organized by Universal Scientific Education and Research Network (USERN), online (2020)
- Invited Talk at the international conference MRS Fall, online (2021)
- Invited Talk at ENI Company, online (2021)
- Invited Talk at MRS Spring Meeting 2021, Symposium EN06, online (2021)
- Invited Talk at XIX Brazil MRS, Symposium C, online (2021)

- Invited Talk at NanoGe Fall Meeting 2020, Symposium: PeroPerFun20, online (2020).
- Invited Talk at Contemporary Stability Challenges in hybrid Perovskite Solar Cells, nanoGe online (2020)
- Invited Talk at Women in Renewable Energy (WiRE) conference, online (2020)
- Invited Talk at Virtual Perovskite conference VIPERCON online (2020).
- Invited Talk at International Conference on Perovskite Thin Film Photovoltaics and Perovskite Photonics and Optoelectronics (NIPHO20), nanoGe Perovskite Conferences, Sevilla (Spain) (2020)

## CONFERENCE ORGANIZATION

I actively take part in the organization of international symposia within the MRS and nanoGe conferences, such as the PEREMER21, NIPHO 22 (organized in Pavia) and NIPHO 24 (which will take place in Sardinia); the E-MRS Symposium O (Halide Perovskites for photonic applications: stability and durability issues); the MRS Fall 2021 symposia. I am in the scientific panel of SPIE Optics+Photonics International Conference 2024 (and I was part of the SPIE Organic Photonics + Electronics in 2022 and in 2020).

## Project Leadership in individual projects as well as collaborative ones with industries

I have been Principal Investigator of 10 projects (since 2019) funded by H2020 ERCEA (ERC StGrant 2018 HYNANO, ERC POC 2022 Spike), Italian Ministry of University (FARE Express 2019, CRUI GoforIT 2019, PRIN Impact 2023), ENI company (4 PhD Fellowship 2020), EDISON (internal collaborative project 2020), Cariplo Foundation (Economia Circolare 2021 FLHYPER), Lombardy Region (Infrastructure DGR 4473/2021, Highlight 2020), Ministry of Economical Transition (GOPV, 2023) for a total of 4.5M Euros.

## ADDITIONAL INFORMATION

### ▪ Promotion of Research and Education:

Since 2019, I serve as the Italian Ambassador for the Universal Scientific Education and Research Network (USERN), a worldwide network of scientists dedicated to promoting ethical and professional scientific research and education (<https://en.wikipedia.org/wiki/USERN>).

I have been Board member of the Young Academy of Europe (YAE) from 2019 to 2022.

I delivered a TEDEX talk at TEDEX Pavia “Solare Innovativo e Materiali Strategici: verso la Sfida Energetica Globale”, online 13 May 2021.

Supervisor two senior researchers, Post-Doc Researchers (9), PhD Students (24), 2 Specialized Technician, Research Fellows (2) and master’s degree students (15) since I have been appointed team leader.

Responsible for Teaching to Master Class in Chemistry at the University of Pavia on courses on: Spectroscopy for solid state and New Materials and Processing for new generation photovoltaics.

### ▪ Promotion of Women in STEM

Since 2019 I am active in several initiative as role model promoting young women scientists and students. I have been listed in the “100 women in STEM against stereotypes” funded by Fondazione Bracco since 2020 and I take part of the Women in Renewable Energy network. In 2021, I have been invited as Panelist of 6th International Day of Women & Girls in Science Assembly, organized by the Royal Academy of Science International Trust (RASIT), and ONU Permanent Missions, United Nations Headquarters, New York. (virtual), 11/02/2021.

### ▪ Editorial Activities

Editor in Chief International Journal of Photoenergy Hindawi (2020-2023); Associate Editor Materials Today Energy ELSEVIER (since 2020); Advisory Board Editor of Chem, Cell Press (2020-2023); Advisory Board Editor of JACS Au (since 2020); Editorial Board Member J. Phys. Mater (since 2020); Advisory Board Editor of ACS Energy Letters since 2023.

### ▪ Involvement in Start-up Creation

I am promoting as Scientific Advisor my PhD student Valentina Larini who is launching a start-up. She presented her idea on recycling perovskite solar cells in the event “Micro, Small and Medium Sized Enterprises (MSME) Day 2023” at ONU, United Nation, NY (June 2023). As Scientific Advisor I discuss with her the business plan, I engage with industrial partners, and I raised the initial round of investment.

During my ERC Starting Grant COVID pandemic happened. To ensure the timely advance of the project, together with other female scientists in Europe, we set up a collaborative network for student exchange and a platform for online events and meeting which resulted in scientific collaborations and joint publications. This was a very important initiative to foster collaborations, expose my students to European scale and start interesting new research and projects.

In 2022 I took a career break for maternity leave which gave me precious time to take care of my family.