

ALESSANDRO MOLLE

Education

2007-2009, Post-Doc fellowship at the CNR-IMM, Agrate Unit, bilateral projects with IMEC, Belgium;
2005-2007, Post-Doc fellowship at the Laboratorio Nazionale MDM, INFM (Agrate Unit) in the EU FP6 "ET4US" project;
2001-05 PhD degree in Materials Science, University of Genoa;
1996-2001, MSc degree (Laurea) in Physics, 110 cum laude, University of Genoa.

Institutional Appointments

2020- Research Director at the CNR-IMM, Agrate Unit;
2018-20 Senior Researcher at the CNR-IMM, Agrate Unit;
2009-18 Staff Researcher at the CNR-IMM, Agrate Unit;
2009 Associate Researcher at the CNR-IMM, Agrate Unit.

Academic Appointments

2018 Chair of the PhD course "Two-dimensional Crystals: Properties, Synthesis, and Applications" at the Univ. Milano Bicocca;
2018 Lecturer at ISSUGE (Istituto di Studi Superiori, Univ. Genoa)
2012-15 Co-chair of the Master Degree course (Physics and Materials Science) "Surface and Interface" at the Univ. Milano Bicocca (3 academic years)
2012-2016 National (italian) qualifications (abilitazione scientifica nazionale <http://abilitazione.miur.it/>):

- full professor (fascia 1), call 2016, D.D. 1532/2016, topic: 02/B1; 03/A2; 03/B2
- associate professor (fascia 2) topic: 02/B1, call 2012, DD. 222/2012; call 2013, DD. 161/2013; topic 03/B1, call 2012, DD. 222/2012; topic 03/B2, call 2012, DD. 222/2012.

Other Appointments

2020 Co-Editor, book "Xenes: 2D Synthetic Materials Beyond Graphene" (Eds. [REDACTED]), Elsevier, Oxford, agreement signed, publication on 2022.
2016 Co-Editor, book "2D Materials for Nanoelectronics" (Eds. [REDACTED]), CRC Press (Taylor&Francis Group), Series on Materials Science and Engineering, Boca Raton (USA) April 5, 2016, ISBN 9781498704175 - CAT# K24702.
2013 Co-Editor - Special Issue of "Applied Surface Science" (Elsevier) Vol. 291, Pages 1-118 (1 February 2014)
2010 Co-Editor - Special Issue of "Microelectronic Engineering" (Elsevier), Vol. 88, Issue 4, Pages 323-534 (April 2011)

Scientific Responsibilities

- 2018-23: ERC Consolidator Grant, Project No. 772261 "XFab", **Role: PI**;
- 2018-23: H2020 FET-Proact-01-2018 Grant No. 824123 "Project SkyTop", Role: key-investigator;
- 2018-20: *Royal Society International 2017 Exchange Grant*, (Bilateral Project) Project No. IES\R3\170384, with Prof. [REDACTED] (Univ. Manchester), **Role: co-applicant**;
- 2017-on: Task responsible in Project CNR-IMM / STMicronic, Task: Characterization of process induced stress in deep trench structures.
- 2016-18: *CNR – Lombardy Region Joint call*, Project: IZEB, under Decree N. 7884 of 05/08/2016 by Lombardy Region, **Role: Unit Coordinator**;
- 2016-2018: *CARIPO Foundation – Regione Lombardia joint call* for the increase of attractiveness

of the Lombardy research system and of the competitiveness of the researchers eligible for the ERC calls, Project: *Crystel*, Fondaz. CARIPLO Prot. N. R1.2016.0011439 of 26/07/2016, **Role: PI**;

● 2015-17: CNR grant "*Joint Lab*", Project "Silicene field effect transistors (SFET)" with the Univ. Texas, Austin, USA (Prof. [REDACTED]), Ref. SRI/217/2014 of 04/09/2014. **Role: PI**;

● 2014-15: U.S. Army Contract no. W911NF-14-1-0612 (lead by Dr. [REDACTED], CNR-IMEM). **Role: Unit coordinator**;

● 2011-14 (3 years): EU-FP7 FET-Open Grant No. 270749, project "2D-NANOLATTICES". **Role: Unit coordinator**.

Awards and Honors

1. 2020: Best Paper Award, Virtual 2020 MRS Fall Meeting, Symposium F.EL04
2. 2014: Ultratech / Cambridge NanoTech Best Paper Award (from ALD User Group Meeting at Stanford University, March 31- April 2, 2014)

Organized Conferences

● 2020: Symp. S.NM06 "Theory and Characterization of 2D Materials--Bridging Atomic Structure and Device Performance", Virtual MRS 2020 Spring/Fall Meeting, Nov. 28-Dec. 4, 2020, USA.

● 7/2020: (Co-Director) Epioptics-16 & Xenos-4 Intl Workshop in the "International School of Solid State Physics", July 25-31, Erice, IT [re-scheduled to 7/2022]

● 2016: Symp. Z "Two dimensional crystals and their van der Waals heterostructures", E-MRS 2016 Spring Meeting, May 2-6, 2016, Lille (FR).

● 2013: Symposium I "The route to post-Si CMOS devices: From high mobility channels to graphene-like 2D nanosheets", E-MRS 2013 Spring Meeting, Mar. 27-31, 2013, Strasbourg (FR).

● 2010: Symposium H "Post-Si-CMOS electronic devices: The role of Ge and III-V materials" E-MRS 2010 Spring Meeting, Strasbourg (FR).

Funding as PI-principal investigator

1. 2018-23: ERC Consolidator Grant, Project No. 772261 "XFab", **Assigned Budget: 2 M€**;
2. 2018-20: Royal Society Intern. 2017 Exchange Grant, Project No. IES\R3\170384, **Assigned budget: 5 k€**;
3. 2016-18: CNR – Lombardy Region Joint call, Project: IZEB, Decree N. 7884 of 05/08/2016 by Lombardy Region, **Assigned budget: 169 k€**
4. 2016-2018: CARIPLO Foundation – Regione Lombardia joint call, Project: Crystel, Fondaz. CARIPLO Prot. N. R1.2016.0011439 of 26/07/2016, **Assigned Budget: 97 k€**.
5. 2015-17: CNR grant "*Joint Lab*", Project "Silicene field effect transistors (SFET)", Ref. SRI/217/2014 of 04/09/2014. **Assigned Budget: 142 k€**;
6. 2014-15: U.S. Army Contract no. W911NF-14-1-0612, **Assigned Budget: 23 k€**;
7. 2011-14: EU-FP7 FET-Open Grant No. 270749, project "2D-NANOLATTICES", **Assigned Budget: 350 k€**.

Publications

125 peer-reviewed papers (Scopus) including:

- 1 Nature Mater.;
- 1 Chem. Soc. Rev.;
- 1 Nature Nanotech.;
- 1 Nature Comm.;
- 4 Adv. Mater.;

3 Adv. Funct. Mater.;
1 Nano Lett.;
1 ACS Nano;
1 Nano Research;
2 Adv. Opt. Mater.;
1 ACS Photon.;
3 2D Materials;
4 Phys. Rev. Lett.;
1 Book (as co-editor) published by CRC Press (Taylor&Francis);
5 Book Chapters.

Talks

1 keynote - ntl conf;
22 invited - intl confs;
7 invited - intl workshops;
10 invited - intl & ntl lectures;
20 contributed - intl confs.

Total number of citations (Scopus): 4355

H-index (Scopus): 28

Bibliometric indexes

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ResearcherID: D-8952-2013

Student Tutoring

- 4 PhD Students;
- 6 Graduate Students;
- 3 Undergraduate Students;
- External examiner for PhD thesis (“Viva”) at Univ. Manchester, UK;
- Doctorate committee member, Politecnico Milano, (STEN-3), 2017;
- Advisor for Dept. Condensed Matter Physics, Univ. Autónoma de Madrid (ES).

Scientific Management Responsibilities and scientific associations

- System manager of 2 MBE apparatus at CNR-IMM;
- Optical lab manager (2 Raman spectrometers, 1 vis-UV spectrometer);
- Scientific responsible for 8 research assignees at CNR-IMM;
- 2018: Executive manager for the installation of an in situ Raman spectroscopy facility (negotiated procedure), CIG 8777811EC6;
- 2018: Executive manager for UV laser installation (negotiated procedure), CIG 77443339C1 2019: Committee member (chair) & for the admission of a negotiation procedure for the set-up of a MBE apparatus at the CNR-IMM, CIG 7748832A72;
- 2018: Executive manager for UV laser installation (negotiated procedure), CIG 77443339C1;
- 2017: Committee member (chair) for the admission of a negotiation procedure for the set-up of a system for the CVD of ultra-thin films at the CNR-IMM, CIG 7251615DFE;
- committee chair for public selections of 2 temporary researcher positions, 3 research assignees at CNR-IMM;
- committee member for public selections of permanent researcher positions at CNR, 6 research

assignees at CNR-IMM;

- 2020: Committee Member for the topic session of “Atomic and Molecular Materials Science” at the IEEE 15th Nanotechnology Materials & Devices Conference (NMDC 2020), Nanjing, China, Oct. 2020 (virtual);
- 2019: Committee member of the PNR (Piano Nazionale della Ricerca) 2021-27 of the MIUR, Topic: Quantum and enabling key technologies;
- 2017: Scientific committee, CNR "Science and Technology Foresight", topic: materials (<http://www.foresight.cnr.it/materials>);

Reviewer Activity

- 2020: Remote expert referee for the European Research Council (ERC), call ERC-2020-COG PE4
- 2018: Reviewer for the Irish Research Council, funding schemes: “Advanced Laureate Award 2018 Programme”, “Ireland Postgraduate Scholarship 2018 programme”
- 2018: Reviewer for the National Science Centre – Poland, funding scheme: OPUS
- 2017: Referee for CNR-SPIN seed project
- 2012: Reviewer - Romanian National Council for Scientific Research (2012 funding call)
- 2012: Scientific Reviewer for two project proposals at the Katholieke Univ. Leuven
- Reviewer for Publishing Groups: Nature Research (Nature Nanotech., Nature Mater., Nature Comm., Scientific Reports), ACS (ACS Nano, Nano Letters, ACS Appl. Mater. Interf., etc.), Wiley (Adv. Mater., Adv. Funct. Mater., Adv. Mater. Interf., Small, Adv. Opt. Mater., etc.), RCS (Nanoscale Horizon, Nanoscale), IOP (2D Materials, Report on Progress in Physics, etc.), AIP (Appl. Phys. Lett., etc.), De Gruyter (Nanophot-), MDPI, IEEE (IEEE El. Dev. Lett., IEEE Trans. El. Dev.), ECS (J. Electrochem. Soc.), APS (Phys. Rev. Lett., Phys. Rev. B), Elsevier (Mater. Today, Nano Energy, etc.)

Research Activities

- Two dimensional Xenes: synthesis and device integration in nanotechnologies;
- Chemical vapor transfer deposition of transition metal dichalcogenides;
- Growth of topological materials.

Dissemination Activities

- 2020: interview for national TV channel Rai+, “SuperQuark+” by [REDACTED]
- 2020: interview for national newspaper “il Sole 24 Ore” (Scenari Nazionali)
- 10/2019: Event Organizer and Speaker at the “Festival della Scienza”, open colloquium on “Flatland beyond Graphene” + short interview at the national TV Rai Cultura channel;
- 6/2019: interviewed by E-MRS TV channel
- 2018: TV service on national TV channel Rai3 “Leonardo”
- 2017: interview at “Uno Mattina”, Rai1 TV channel (direct TV)
- 2018: interview at radio broadcast Radio 24 “Smart City” program
- 2017-18: interview for national newspapers “La Stampa” (TuttoScienze) and “Il Sole 24 Ore”

Patents

1) L. Tao, D. Akinwande, C. Grazianetti, A. Molle, “ Integration of air-sensitive two-dimensional materials on arbitrary substrates for the manufacturing of electronic devices” US Patent: No. 10.242.844 B2, March 26, 2019

Website

<https://www.mdm.imm.cnr.it/users/molle-alessandro>

<https://alessandromolle.wixsite.com/xfab>