Andrea Bassi's Curriculum Vitae

June 2024

Personal Information

Place and date of birth:
Trento, 20 May 1978

Contact

Andrea Bassi
Politecnico di Milano
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Education:

- Jan 2003 - May 2006: Ph.D. in *Physics*
  Politecnico di Milano, Italy
  Thesis: "Large bandwidth time-resolved optical spectroscopy of diffusive media".
  Supervisor: Prof. Rinaldo Cubeddu.
- Sept 1997 - Dec 2002: Laurea Degree in *Biomedical Engineering*
  Politecnico di Milano, Italy

Academic career:

- Associate Professor (Nov 2014 - today)
  Dipartimento di Fisica, Politecnico di Milano, Italy.
- Visiting scientist (Jul 2018 - Aug 2018)
  Department of Mechanical Engineering, Columbia University, New York, USA.
- Marie Curie Fellow (Sept 2013 - Sept 2014)
  Max Planck Institute for Molecular Cell Biology and Genetics, Dresden, Germany.
- Visiting scientist (Jan 2010 – Aug 2013)
  Mario Negri Institute for Pharmacological Research, Milano, Italy
- Researcher (May 2006 - Nov 2014)
  Dipartimento di Fisica, Politecnico di Milano, Italy.
- Research Specialist (Aug 2005 - Feb 2006)
  Beckman Laser Institute and Medical Clinic, University of California, Irvine, USA.

Responsibility of Research Grants:

- "Training network for Next generation cellular Screening, NEXTSCREEN". **MARIE SKŁODOWSKA-CURIE ACTIONS, Doctoral Network (HORIZON-MSCA-2022-DN), EU**. *Coordinator of the consortium*. Grant amount: 2.6M€ (~600k€ to Polimi), for training 10 PhDs students in EU (2023-2027), 3 enrolled at Politecnico di Milano. The field of research is the integration of optical microscopy with microfluidics for high throughput cellular screening.
- "Revolutionizing Spatial Biology with a cutting-edge Multi-Scale Imaging platform". **HORIZON-EIC-TRANSITION-2023, EU**. *Local coordinator.* Grant amount: 499 k€ to Polimi (2023-2026). The project aims to enhance Structured Illumination Microscopy and increase its technology readiness level.
- "3D Structured Illumination Microscopy processing with GPU acceleration", "Point-Spread Function Simulator for Fluorescence Microscopy", and "Registration of Regions of Interest in

Time-Lapse Data" grants. **Chan Zuckerberg Initiative, napari Plugin Foundations Grants, USA**. project NP2-0000000032, *Principal investigator*. Grants amount: ~50k$ (2022-2023).

- "Chromatin organization PROfiling with high-throughput super-resolution microscopy on a CHIP". **H2020, FET-OPEN, EU**. *Scientific coordinator* of the consortium and local coordinator for the Polimi unit. Grant amount: 2.4M€ of which 230k€ to Polimi (2018-2022).
- "LaserLab Europe, Joint Research Activity, BIOAPP". **H2020, Large Scale Infrastructures, EU**. *Task Leader* (2019-2024).
- "Multichannel microelectronics for arrays of Single Photon detectors and time-resolved processing for the optical spectroscopy of biological tissues" **PRIN project, MIUR, Italy**. Local coordinator. Grant amount: 80k€ to Polimi (2011-2013).
- "Novel tumour vascular targets: investigation with optical imaging in adult zebrafish" (**Cariplo Foundation, Italy**. *Local coordinator*. Grant amount: 68k€ to Polimi (2010-2012).
- Responsible for several travel fellowships funded by **European Molecular Biology Organization, LaserLab-Europe, British Council, Erasmus Mundus and Erasmus+**.

Awards:

- Winner of the Switch to product (S2P), entrepreneurial empowerment programme with the team "Flochip", to increase the TRL level of miniaturized microscopes. **PoliHub/Deloitte, Italy** (2022). Project coordinator. Prize amount: 30k€.
- Fellowship of the **Chinese Academy of Sciences, CAS President's International Fellowship (PiFi), China** (2020) for the project "Microscopes on a chip", Shenzhen Institutes of Advanced Technology of Chinese Academy of Sciences. Fellowship amount: ~8k€.
- "Combined Selective Plane Illumination Microscopy and Optical Projection Tomography for in vivo quantitative imaging of the developing zebrafish vasculature". **FP7, Marie Curie, Individual Fellowship, EU** (2013). Fellowship amount: ~84k€ (1-year fellowship).

Professorship licences (Abilitazione nazionale italiana) as Full Professor:

- 02/B1 - FISICA SPERIMENTALE DELLA MATERIA
  02/D1 - FISICA APPLICATA, DIDATTICA E STORIA DELLA FISICA

Teaching activities:

- Physics simulations in *Python* (within the course of Physics I), Physics Engineering Students (2021-today), Politecnico di Milano, ~ 80 students.
  Source code available here: https://github.com/andreabassi78/Vpython_Applications
- Bio-photonics (Optical Microscopy module), 5 ECTS, for Physics Engineering Students (2019-today), Politecnico di Milano, ~ 40 students,
- Fundamentals of Experimental Physics, 10 ECTS credits. The course is part of the *MEDTEC* program at Humanitas University and Politecnico di Milano (2019-2023), ~ 70 students.
- Foundations of Electromagnetism, 10 ECTS credits, for Biomedical Engineering Students (2017-2019), Politecnico di Milano, ~ 250 students.
- Experimental Physics (Mechanics and Thermodynamics), 10 ECTS credits, for Management Engineering Students (2007-2012 and 2015-2016), Politecnico di Milano, ~ 250 students.

- *Advisor* of >30 Master-Degree theses in Physics and Biomedical Engineering (~10 theses conducted abroad), 7 PhD students (2 concluded, 5 active) and 6 Post-Docs (5 concluded, 1 active).

Other institutional activities:

- Responsible for **Erasmus and International Mobility** for Physics Engineering at Politecnico di Milano (2017-today).
- Member of the board of the **Doctoral School in Physics** at **Politecnico di Milano** (2022).
- Member of the board of the **Doctoral School in Experimental and Clinical Pharmacology** at **Mario Negri Institute for Pharmacological Research** (2023-2026)
- Scientific responsible of the Optical Microscopy and Tomography (OMT-FAST-FMT) laboratory and RADL at the Department of Physics of Politecnico di Milano.
- Member of the Quality Assessment group (Assicurazione della Qualità, Gruppo AQ) for the MEDTEC double-degree course in Biomedical Engineering and Medicine at Politecnico di Milano and Humanitas University (2019-2022).
- Member of the Technology Foresight panel at Politecnico di Milano (2023-2024)

Reviewing and editorial activities:

- Evaluator, Rapporteur, Panel member and Expert monitor, for the European Commission (7 appointments, 2017-2024).
- Reviewer for the Swiss National Science Foundation, Switzerland (2024).
- Reviewer, rapporteur and panel member for Latvian Council of Science (LCS), Applied research projects, Republic of Latvia, 2021.
- Reviewer for Dutch Research Council, Nederlandse Organisatie voor Wetenschappelijk Onderzoek, Netherland, 2019-2020.
- Reviewer for Ministero dell'Istruzione dell'Università e della ricerca, Futuro in Ricerca projects in 2011 and SIR projects, Italy 2014.
- Reviewer for Fundação para a Ciência e a Tecnologia, Health Sciences area projects, Portugal, 2010.
- **Reviewer for** several **scientific journals** including:
  Nature Methods, Optics Letters, Optics Express, Applied Optics, Journal of the Optical Society of America A, IEEE Transaction on Medical Imaging, Journal of Biomedical Optics, Microscopy and Microanalysis, PLoS ONE, Scientific Reports, Biophysical Journal, Nature Plants, Light Science & Applications.
- **Editor** for the **scientific journals**:
  Scientific Report (Springer Nature, 2021-today).
  Frontiers in Physics and Frontiers in Physiology (Frontiers Research Foundation, 2019-today).
- **Member of PhD committees** at:
  Technische Universität (TU) Dresden (Germany, 2017), Delft University of Technology (Netherlands, 2018), University Carlos III of Madrid (Spain, 2020), Italian Institute of Technology (Italy, 2021-2023), École Polytechnique Fédérale de Lausanne, EPFL (Switzerland, 2022), Universitè Paris Saclay (France, 2023), Imperial College London (UK, 2023).

Scientific interests

AB has a background in developing optical and laser-based technologies for *diffuse optical imaging* and their application in *biophotonics* and *biological imaging*. He has recently focused his research on fluorescence optical methods, specifically for *three-dimensional and tomographic imaging* of biological specimens, ranging from single cells to entire organisms and small animals.
Currently, he is primarily interested and involved in research and innovation projects related to:

- high-speed imaging for quantifying fast dynamical biological processes using advanced optical microscopes, especially light sheet microscopy.
- high-throughput technologies for automatically imaging single cells (imaging flow cytometry). He is currently working on developing low-cost and miniaturized photonics devices for three-dimensional high-throughput microscopy.

He is also actively developing open-source code (*python*) for processing, visualizing, and quantifying biomedical data, particularly for high-resolution microscopy. Example code is available on GitHub (@andreabassi78) and NapariHub: https://www.napari-hub.org/plugins/napari-sim-processor

Highlighted scientific collaborations:

- Alex Costa (Department of Lifesciences, University of Milano).
- Mark Neil (Department of Physics, Imperial College London).
- David Rousseau (Physics Department, Université d'Angers).
- Alessio Zippo (Department of Cellular, Computational and Integrative Biology, UniTN).
- Simon Arridge (Dept. of Computer Science, University College London).
- Raffaella Giavazzi (Mario Negri Institute for Pharmacological Research).

Scientific contribution:

- Author of ~100 papers on peer-reviewed journals, ~90 abstracts and proceedings of international conferences.
- H-index: 37 (Scholar), 35 (Scopus). Total citations >3600 (Scholar), >3000 (Scopus).
- 4 patents granted and licensed to industry and 2 patent applications.

Conferences and Workshops organization and invited contribution (last 10 years):

- Laserlab-Europe Conference, Lisbon, Portugal, May 2024, **Organizer**.
- Multidimensional optical microscopy, napari workshop, Milano, Italy, Sept 2023, **Organizer**.
- Conference of the Condensed Matter Division of the European Physical Society (CMD30-FisMat 2023) Milano, Italy, Sept 2023. **Member of the Organizing Committee**.
- IX International School and Conference on Photonics (PHOTONICA2023), Belgrade, Serbia, August 2023, **Keynote speaker**.
- New microscopes in cell biology, workshop. Institute Monod, Paris, Dec 2022. **Invited speaker**.
- Sino-Italian Workshop, Microscopy combined with fluidics, Shenzhen Institute of Advanced Technologies, Chinese Academy of Sciences, Milano-Shenzen, Sept 2022. **Organizer and chair**.
- VI Photonics meets biology Summer School, Spetses, Greece, July 2022. **Invited speaker**.
- Fluorescence Neuro-Imaging and Photonics Program (FNIP), Padova, Jun 2022. **Invited speaker**.

- 17th European Molecular Imaging Meeting (EMIM), Thessaloniki, Greece, March 2022. **Invited speaker and session Chair**.
- Light4Health seminar series, The Institute of Photonic Sciences (ICFO), Spain, April 2021. **Invited speaker**.
- Modern imaging techniques in biology workshop, Department of Lifesciences, Unimi, Italy, Sept 2021. **Invited speaker**.
- Molecular Foundry User Meeting, Berkeley Lab, Berkeley, USA, Aug 2020. **Invited speaker**.
- School for Functional Microscopy in Biology (MiFoBio), Seignosse, France, Oct 2018. **Invited speaker**.
- Advances in label-free and fluorescence microscopy Workshop, PoliTo, Torino, June 2018 (organized by Nikon). **Invited speaker**.
- Nanoscopy & Light Sheet Microscopy Workshops, Padova, Italy, June 2017 (organized by Leica Microsystems). **Invited speaker**.
- SPIE Optical Metrology, Laser World of Photonics Congress, Munich, Germany, June 2017. **Invited speaker**.
- Light sheet fluorescence microscopy Workshop, Napoli, Italy, Dec 2016 (organized by Leica Microsystems). **Invited speaker**.
- BioImaging Workshop, Lyon, June 2016 (organized by Univ. Lyon). **Invited speaker**.
- Advanced course on Optogenetics, Paris, Nov 2014 (organized by Institute Curie, Paris). **Invited speaker**.
- Workshop on Plant Imaging, Montpellier, April 2014 (organized by Zeiss GmbH). **Invited speaker**.

Selected publications (10):

1. Calvarese, M., Paiè, P., Candeo, A., Calisesi, G., Ceccarelli, F., Valentini, G., Osellame R., Gong H., Neil M., Bragheri F., & **Bassi, A.** (2022). Integrated optical device for Structured Illumination Microscopy. Optics Express, 30(17), 30246-30259.
2. Calisesi, G., Ghezzi, A., Ancora, D., D'Andrea, C., Valentini, G., Farina, A., & **Bassi, A**. (2022). Compressed sensing in fluorescence microscopy. Progress in Biophysics and Molecular Biology, 168, 66-80.
3. Ancora, D., Furieri, T., Bonora, S., & **Bassi, A**. (2021). Spinning pupil aberration measurement for anisoplanatic deconvolution. Optics Letters, 46(12), 2884-2887.
4. Sala, F., Castriotta, M., Paiè, P., Farina, A., D'Annunzio, S., Zippo, A., Osellame R., Bragheri F.& **Bassi, A**. (2020). High-throughput 3D imaging of single cells with light-sheet fluorescence microscopy on chip. Biomedical optics express, 11(8), 4397.
5. Ancora, D., & **Bassi, A**. (2020). Deconvolved image restoration from auto-correlations. IEEE Transactions on Image Processing, 30, 1332-1341.
6. Calisesi, G., Castriotta, M., Candeo, A., Pistocchi, A., D'Andrea, C., Valentini, G., Farina A., & **Bassi, A**. (2019). Spatially modulated illumination allows for light sheet fluorescence microscopy with an incoherent source and compressive sensing. Biomedical optics express, 10(11), 5776-5788.
7. Paiè, P., Martínez Vázquez, R., Osellame, R., Bragheri, F., & **Bassi, A**. (2018). Microfluidic based optical microscopes on chip. Cytometry Part A, 93(10), 987-996.
8. **Bassi, A**., Schmid, B., & Huisken, J. (2015). Optical tomography complements light sheet microscopy for in toto imaging of zebrafish development. Development, 142(5), 1016-1020.
9. Fieramonti, L., Foglia, E. A., Malavasi, S., D'Andrea, C., Valentini, G., Cotelli, F., & **Bassi, A**. (2015). Quantitative measurement of blood velocity in zebrafish with optical vector field tomography. Journal of biophotonics, 8(1-2), 52-59.

10. Costa, A., Candeo, A., Fieramonti, L., Valentini, G., & **Bassi, A**. (2013). Calcium dynamics in root cells of Arabidopsis thaliana visualized with selective plane illumination microscopy. PLoS One, 8(10), e75646.

Full list of publications updated at: *https://scholar.google.it/citations?user=8ZHx3j8AAAAJ&hl=en*