

PERSONAL INFORMATION

Alberto Bravin



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Sex M | Date of birth 18/07/1968 | Nationality Italian

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<https://publons.com/researcher/AAN-6114-2020/>

PRESENT POSITION & AFFILIATION

10/2021 - ongoing

**Full Professor of Applied Physics – Sector 02/D1 - FIS-07 (Professore ordinario)**

Università degli Studi di Milano Bicocca, Milano, Italy

PROFESSIONAL CAREER

1/06/2006 – 30/09/2021

**Senior scientist**

European Synchrotron Radiation Facility, Grenoble, France

- In charge of the ID17 Biomedical Beamline, a platform to perform advanced X-ray imaging and X-ray radiotherapy research; managing of budgets, and the team
- In charge of the Biomedical facility, ancillary laboratories for cellular, tissular and animal research
- Coordinator of the in-house research in imaging and therapy

20/09/1999 – 31/05/2006

**Post-doc and junior scientist**

European Synchrotron Radiation Facility, Grenoble, France

- In charge of the user support in, and the development of, experimental radiotherapy (Microbeam Radiation Therapy)
- In charge the user support of and the development in X-ray phase contrast imaging

01/01/1999 – 15/09/1999

**Post-doc**

ELETTRA Sincrotrone S.c.p.A, Trieste, Italy

- In charge of the technical development of the X-ray beamline (design of the X-ray monochromator) and user support in X-ray imaging applications

EDUCATION AND TRAINING

2018

**Habilitation to Full University Professor**

- Sector 02/D1 – Applied Physics, Italy

2018

**Habilitation to Associated University Professor**

- Sector 06/I1 – Radiology, Radiotherapy and Neuroradiology, Italy

1999

**Ph.D. in Physics, University of Trieste, Italy**

1995

**Laurea in Physics, University of Trieste, Italy (110 cum laude/110)**

RESEARCH INTERESTS

- Application of X-ray nano- and micro-resolution imaging to fundamental and clinically oriented research
- Development of innovative X-ray radiotherapy methods
- Applications of X-rays to cultural heritage conservation
- X-ray optics, instrumentation and analysis techniques

PERSONAL SKILLS

Mother tongue(s) Italian

Other language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C2I	C2	C2	C2	C2
French	C2	C1	C1	C1	C1

Levels: A1/2: Basic user - B1/2: Independent user - C1/2 Proficient user Common European Framework of Reference for Languages

COMMISSION OF TRUST AND MEMBERSHIP (ongoing)

- 2020 – Member of the Editorial board of the “Physica Medica” journal
- 2017 – Member of the Editorial Board of the “Scientific Reports” journal
- 2016 – Appointed fellow of the “American Association of Medical Physics”
- 2016 – Member of the Board of Associated Editors of the “Medical Physics” journal
- 2015 – Member of the scientific committee of the compact source “ThomX”, Orsay, France
- 2015 – Member of the BIOIMAGING conference committee
- 2010 – Member of the Intern. Editorial Board of the “Physics in Medicine & Biology” journal
- 2010 – Member of the Beamtime allocation panel of the “Canadian Light Source”, Saskatoon, Canada

COMMISSION OF TRUST AND MEMBERSHIP (past)

- 2017 – 2021 Member of the Management board of the EU COST Action CA16122 BIONECA
- 2010 – 2021 Member of the Ethical committee #113 for animal experimentation, France
- 2008 – 2021 Member of the Beamtime allocation panel of ELETTRA synchrotron, Trieste, Italy
- 2013 – 2017 Chair of the EU-FP7 COST TD1205 Action on “Innovative Methods in Radiotherapy and Radiosurgery using synchrotron radiation”
- 2009 – 2013 Member of the Scientific Advisory Board of the “Medical Beamline”, Australian Light Source, Melbourne, Australia
- 2009 - 2015 Deputy X-ray Imaging Group Head, European Synchrotron Radiation Facility, Grenoble France

ACADEMIC ACTIVITIES

- 2021-2022 **University Milano Bicocca, Faculty of Informatics**
  - Bachelor courses: Physics
- 2018-2019 **University La Sapienza, Rome, Italy, Doctorate school in Physics**
  - Cycle of seminars in “X-ray instrumentation, imaging, optics”
- 2013 - ongoing **University Milano Bicocca, Milan Italy, Doctorate school in Neurosciences**
  - Seminars on “X-ray methods”
- 2009 - 2021 **University Grenoble Alpes, Faculty of Physics**
  - Master 2 in Medical Physics: seminars on “X-ray phase contrast imaging methods”

- 2006 -ongoing **PhD Thesis supervision**  
 ■ 7 students at 5 different European Universities

**GRANTS AND MANAGED FUNDS**

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- 2006-2021 **ESRF scientist**  
 ■ 5 Millions euro (defended and managed internally)
- 2013-2017 **TD1205 COST Action Chair**  
 ■ 450,000 euro
- 2006 - 2022 **European and extraeuropean projects**  
 ■ I have participated and managed work packages in a dozen of international projects in different EU Countries, i.e. by the Associazione Italiana Ricerca sul Cancro, German Research Foundation (DFG), Norwegian Academy of Science, Sweden Academy of Science and Australian NHMRC foundation

**CERTIFICATIONS**

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- 2017 European Certification FELASA (Federation of European Laboratory Animal Science)  
 ■ category C (Person responsible for directing animal experiments)  
 ■ category D (laboratory animal science specialist)

**AWARDS**

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- 2021 Médaille d'honneur de travail en argent” assigned by the Préfecture de l'Isere (France); The Silver Work Medal of Honor is intended to reward employees with at least 20 years of service who have undertaken initiatives of exceptional quality in the exercise of their profession.
- 2018 “Outstanding scientist award” assigned by the Italian Society of Synchrotron Radiation. Prize awarded annually to a scientist with at least 20 years of experience in the use of synchrotron light, who has obtained scientific results of an exceptional level.

**PUBLICATION FIGURES**

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Publications	Book chapters	5
	Peer reviewed papers	227
	Conference papers	41
Bibliographic H-index	Web of knowledge	45
	Google Scholar	57
Bibliographic i-index	Google Scholar	161
Citations	Web of knowledge	7382
	Google Scholar	10812

## LIST OF PUBLICATIONS (LAST 5 YEARS)

Peer reviewed papers  
(2017)

1. L. Broche, G. Perchiuzzi, L. Porra, A. Tannoia, et al. "Dynamic Mechanical Interactions between Neighboring Airspaces Determine Cyclic Opening and Closure in Injured Lung", **Critical Care Medicine** **2017** Apr;45(4):687-694
2. Cedola A, Bravin A, Bukreeva I, Fratini M, et al. "X-Ray Phase Contrast Tomography Reveals Early Vascular Alterations and Neuronal Loss in a Multiple Sclerosis Model." **Sci Rep.** **2017** Jul 19;7(1):5890
3. Y. Ivanishko, A. Bravin, S. Kovalev, P. Lisutina, et al. "Feasibility Study of the 3D Visualization at High Resolution of Intra-Cranial Rabbit Eyes With X-Ray CT Phase-Contrast Imaging, **Invest Ophthalmol Vis Sci.** **2017**;58:5941–5948.
4. S Gasilov, A Mittone, T dos Santos Rolo, ..A Bravin, and T Baumbach "The generalized pupil function of a compound X-ray refractive lens", **Optics Express** **2017** Oct 16;25(21):25090-25097
5. S. Gasilov, A. Mittone, T. dos Santos Rolo,.. A. Bravin, and T. Baumbach "Refraction and ultra-small angle scattering of X-rays in a single crystal diamond compound refractive lens", **J. Synchrotron Radiation** **2017**, 24, 1137–1145
6. Fardone E, Bravin A, Conti A, Bräuer-Krisch E, et al. "Rat sensorimotor cortex tolerance to parallel transections induced by synchrotron-generated X-ray microbeams.", **Sci Rep.** **2017** Oct 30;7(1):14290
7. A Mittone, I Manakov, L Broche, C Jamias, P Coan, and A Bravin "Characterization of a sCMOS-based high resolution imaging system", **J. Synchrotron Radiation** (2017) 24, 1226–1236

## (2018)

8. A Mittone, A Bravin and P Coan "Low-dose quantitative phase contrast medical CT" **Meas. Sci. Technol.** 29 (2018) 024006
9. E. Longo, A. Bravin, F. Brun, I. Bukreeva, et al. "3D map of theranostic nanoparticles distribution in mice brain and liver by means of X-ray Phase Contrast Tomography" **Journal of Instrumentation** **2018**, 3 C01049
10. Geith T, Brun E, Mittone A, Gasilov S et al. "Quantitative Assessment of Degenerative Cartilage and Subchondral Bony Lesions in a Preserved Cadaveric Knee: Propagation-Based Phase-Contrast CT Versus Conventional MRI and CT.", **AJR Am J Roentgenol.** **2018** Jun;210(6):1317-1322
11. G.E. Barbone, A. Bravin, P. Romanelli, A. Mittone et al. "Micro-imaging of brain cancer radiotherapy using phase-contrast computed tomography", **Int. J. Rad. Oncol. Biol. Phys.**, Vol. 101, No.4, pp.965-984, **2018**
12. Ivanov D, Bliznakova K, Buliev I, Popov P, ... Bravin A, and Bliznakov Z. "Suitability of low density materials for 3D printing of physical breast phantoms", **Phys Med Biol.** **2018** Sep 6;63(17):175020
13. Mittone A, Ivanishko Y, Kovalev S, Lisutina P, Lotoshnikov M, Tkachev S, Tkacheva M, Crippa L, Dmitriev V, and Bravin A. "High resolution hard X-ray 3D mapping of a Macaca fascicularis eye: A feasibility study without contrast agents", **Physica Medica** **2018** Jul;51:7-12
14. T. Schulz-Mirbach, M. Olbinado, A. Rack, A. Mittone, et al. "In-situ visualization of soundinduced otolith motion using hard X-ray phase contrast imaging", **Scientific Reports** 8:3121 (2018)
15. D. Micieli, D. Di Martino, M. Musa, L. Gori, A. Kaestner, A. Bravin, A. Mittone, R. Navone, and G. Gorini Characterizing pearls structures using X-ray phase-contrast and neutron imaging: a pilot study, **Scientific Reports** 8:12118 (2018)
16. Fardone E, Pouyatos B, Bräuer-Krisch E, Bartzsch S, ... Bravin A, and Romanelli P. "Synchrotron-generated microbeams induce hippocampal transections in rats", **Sci Rep.** **2018** Jan 9;8(1):184
17. Ceresa C, Nicolini G, Semperboni S, Gandin V, et al. "Evaluation of the Profile and Mechanism of Neurotoxicity of Water-Soluble [Cu(P)4]PF6 and [Au(P)4]PF6 (P = thp or PTA) Anticancer Complexes.", **Neurotox Res.** **2018** Jul;34(1):93-108
18. V. Di Trapani, A. Bravin, F. Brun, D. Dreossi, et al. "Characterization of noise and efficiency of the Pixirad-1/Pixie-III CdTe X-ray imaging detector", **J. Instrumentation** (2018) 13 (12), C12008

**(2019)**

19. Esposito G, Mettievier G, Bliznakova K, Bliznakov Z, Bosmans H, Bravin A, Buliev I, Di Lillo F, Ivanov D, et al. "Investigation of the refractive index decrement of 3D printing materials for manufacturing breast phantoms for phase contrast imaging", **Phys Med Biol.** **2019** Mar 27;64(7):075008
20. Scaramuzzo G, Broche L, Pellegrini M, Porra L, Derosa S, Tannoia AP, Marzullo A, Borges JB, Bayat S, Bravin A, Larsson A, Perchiuzzi G. "Regional Behavior of Airspaces During Positive Pressure Reduction Assessed by Synchrotron Radiation Computed Tomography", **Frontiers of Physiology** **2019** Jun 7;10:719,
21. Broche L, Pisa P, Porra L, Degrugilliers L, Bravin A, Pellegrini M, Borges JB, Perchiuzzi G, Larsson A, Hedenstierna G, Bayat S. "Individual Airway Closure Characterized In Vivo by Phase-Contrast CT Imaging in Injured Rabbit Lung", **Crit Care Medicine** Sep;47(9):e774-e781, **2019**
22. G. Scaramuzzo, L. Broche, M. Pellegrini, L. Porra, S. Derosa, A.P. Tannoia, A. Marzullo, J.B. Borges, S. Bayat, A. Bravin, A. Larsson, G. Perchiuzzi "Effect of positive end-expiratory pressure on lung micromechanics assessed by Synchrotron Radiation Computed Tomography in an animal model of ARDS", **Journal of Clinical Medicine** Jul 28;8(8), **2019**
23. Spiga J, Pellicoli P, Manger SP, Duffy JA, Bravin A, "Experimental benchmarking of Monte Carlo simulations for radiotherapy dosimetry in the presence of metal-based compounds using monochromatic X-ray beams", **Physica Medica**, **2019** Sept; 66: 45-54

**(2020)**

24. I Bukreeva, V. Asadchikov, A. Buzmakov, M. Chukalina, A. Ingacheva, N.A. Korolev, A. Bravin, A. Mittone, G.E.M. Biella, A. Serra, F. Brun, L. Massimi, M. Fratini, A. Cedola "High resolution 3D visualization of the spinal cord in a post-mortem murine model", **Biomedical optics express** **2020**, Vol. 11, No. 4, 2235-2253
25. T. Schulz-Mirbach, F. Ladich, A. Mittone, M. Olbinado, A. Bravin, I.P. Maiditsch, R.R. Melzer, P. Krysl, M. Heß "Auditory chain reaction: Effects of sound pressure and particle motion on auditory structures in fishes", **Plos One** 15(3): e0230578
26. Buchanan, A. Mittone, A. Bravin, P. Diemoz, M. Endrizzi, A. Olivo "Simplified retrieval method for Edge Illumination X-ray phase contrast imaging allowing multi-modal imaging with fewer input frames", **Optics express** **2020**, Vol.28 (8) 11597-11608
27. G. Barbone, A. Bravin et al. Establishing sample-preparation protocols for X-ray phase-contrast CT of rodent spinal cords: aldehyde fixations and osmium impregnation", **Journal of Neuroscience Methods** **2020**, Volume 339, 1 June, 108744
28. G. Begani Provinciali, N. Pieroni, I. Bukreeva, M. Fratini, L. Massimi, L. Maugeri, F. Palermo, F. Bardelli, A. Mittone, A. Bravin, G. Gigli, F. Gentile, A. Fossaghi, N. Riva, A. Quattrini, and A. Cedola, "X-ray phase contrast tomography for the investigation of amyotrophic lateral sclerosis", **J. Synchrotron Rad.** **(2020)**. 27, 1042–1048
29. A. Mittone, L. Fardin, F. Di Lillo, M. Fratini, H. Requardt, A. Mauro, R.A. Homs-Regajo, P-A Douissard, G.E. Barbone, J. Stroebel, M. Romano, L. Massimi, G. Begani-Provinciali, F. Palermo, S. Bayat, A. Cedola, P. Coan and A. Bravin "Multiscale pink-beam microCT imaging at the ESRF-ID17 biomedical beamline", **J. Synchrotron Rad.** **(2020)**. 27, 1347–1357
30. J. Stroebel, A. Homg, M. Ambruster, A. Mittone, M. Reiser, A. Bravin & P. Coan "Convolutional neuronal networks combined with X-ray phase-contrast imaging for a fast and observer-independent discrimination of cartilage and liver diseases stages", **Scientific Reports** **(2020)** 10:20007
31. A. Barosi, P. Dunkel, E. Guénin, Y. Lalatonne, Ph. Zeitoun, I. Fitton, C. Journé, A. Bravin, A. Maruani, H. Dhimane, L. Motte, and P.I. Dalko Synthesis and activation of an iron oxide immobilized drug-mimicking reporter under conventional and pulsed X-ray irradiation conditions + Suppl. Materials, **RSC Adv.** **2020**, 10, 3366–3370
32. Brun F, Di Trapani V, Albers J, Sacco P, Dreossi D, Brombal L, Rigon L, Longo R, Mittone A, Dullin Ch, Bravin A, Delogu P "Single-shot K-Edge subtraction X-ray discrete computed tomography with a polychromatic source and the Pixie-III detector", **Physics in Medicine and Biology**, **(2020)** Vol. 6, Issue 5, article 65 055016
33. A. Mittone, L. Fardin, F. Di Lillo, M. Fratini, H. Requardt, A. Mauro, R.A. Homs-Regajo, P-A Douissard, G.E. Barbone, J. Stroebel, M. Romano, L. Massimi, G. Begani-Provinciali, F. Palermo, S. Bayat, A. Cedola, P. Coan and A. Bravin "Multiscale pink-beam microCT imaging at the ESRF-ID17 biomedical beamline", **J. Synchrotron Rad.** **(2020)** 27, 1347–1357
34. K. Dupraz, M. Alkadi, M. Alves et al. "The ThomX ICS source", **Physics Open** **(2020)** Vol.5, art 100051

35. V. Di Trapani, A. Bravin, F. Brun, D. Dreossi, R. Longo, A. Mittone, L. Rigon, P. Delogu, "Characterization of the acquisition modes implemented in Pixirad-1/Pixie-III X-ray Detector: effects of charge sharing correction on spectral resolution and image quality", **NIMA** **220**, 955-163220
36. A. Mittone, L. Fardin, F. Di Lillo, M. Fratini, H. Requardt, A. Mauro, R.A. Homs-Regojo, P-A Douissard, G.E. Barbone, J. Stroebel, M. Romano, L. Massimi, G. Begani-Provinciali, F. Palermo, S. Bayat, A. Cedola, P. Coan and A. Bravin "Multiscale pink-beam microCT imaging at the ESRF-ID17 biomedical beamline", **J. Synchrotron Rad.** (2020) **27**, 1347–1357

#### (2021)

37. G.E. Barbone, A. Bravin, A. Mittone, S. Grosu, J. Ricke, G. Cavaletti, V. Djonov, P. Coan, "High-Spatial-Resolution Three-dimensional Imaging of Human Spinal Cord and Column Anatomy with Postmortem X-ray Phase-Contrast Micro-CT", **Radiology**, (2021) 298(1):135-146
38. Horng A, Stroebel J, Geith T, Milz S, Pacureanu A, Yang Y, Cloetens P, Lovric G, Mittone A, Bravin A, Coan P, "Multiscale X-ray phase contrast imaging of human cartilage for investigating osteoarthritis formation" **J. of Biomedical science** (2021) 28(1) 42
39. P. Mocchi, A. Sierra, L. Maugeri, E. Stefanutti, A. Abdollahzadeh, F. Mangini, M. Moraschi, I. Bukreeva, L. Massimi, F. Brun, J. Tohka, O. Grohn, A. Mittone, A. Bravin, C. Nicaise, F. Giove, A. Cedola, M. Fratini, "Steerable3D: An ImageJ plugin for neurovascular enhancement in 3-D segmentation", **Physica Medica** (2021) 81, 197-209
40. L. Fardin, L Broche, G Lovric, A Mittone, O Stephanov, A Larsson, A Bravin, S Bayat, "Imaging atelectrauma in Ventilator-Induced Lung Injury using 4D X-ray microscopy", **Scientific Reports**, (2021) 11:4236
41. Romano M, Bravin A, Mittone A, Eckhardt A, Barbone G, Sancey L, Dinkel J, Bartzsch S, Ricke, ... "A multi-scale and multi-technique approach for the characterization of the effects of spatially fractionated X-ray radiation therapies in a preclinical model" **CANCERS** (2021) vol. 13 (19)
42. Longo E, Sancey L, Cedola A, Barbier EL, Bravin A, Brun F, Bukreeva I, Fratini M, Massimi L, Greving I, Le Duc G, Tillement O, De La Rochefoucauld O, Zeitoun P. "3D Spatial Distribution of Nanoparticles in Mice Brain Metastases by X-ray Phase-Contrast Tomography", **Front Oncol.** 2021 May 25;11:554668
43. M.D. Wright, P. Romanelli, A. Bravin, G. Le Duc, E. Brauer-Krisch, H. Requardt, S. Bartzsch, R. Hlushchuk, J-A Laissue, V. Djonov "Non-conventional Ultra-High Dose Rate (FLASH) Microbeam Radiotherapy Provides Superior Normal Tissue Sparing in Rat Lung Compared to Non-conventional Ultra-High Dose Rate (FLASH) Radiotherapy" **Cureus** (2021) 13(11): e19317

#### (2022)

44. M. Romano, A. Bravin, M. D. Wright, L. Jacques, A. Miettinen, R. Hlushchuk, J. Dinkel, S. Bartzsch, J. A. Laissue, V. Djonov, P. Coan, "X-Ray Phase Contrast 3D Virtual Histology: Evaluation of Lung Alterations After Microbeam Irradiation", **Int. J. of Radiation Oncology Biology Physics** (2022), Vol.112, Issue 3, 1 March, 818-830
45. S. Bayat, L. Fardin, J. L. Cercos-Pita, G. Perchiazzi, A. Bravin, "Imaging Regional Lung Structure and Function in Small Animals Using Synchrotron Radiation Phase-Contrast And K-Edge Subtraction Computed Tomography", **Frontiers in Physiology** (2022) in press
46. J.-L. Cercos-Pita, L. Fardin, H. Leclerc, B. Maury, G. Perchiazzi, A. Bravin, S. Bayat "Lung tissue biomechanics imaged with synchrotron phase contrast microtomography in live rats", **Scientific Reports** (2022) 12, 5056

#### Books

1. P.C. Diemoz, A. Bravin, P. Coan, and L. Rigon, "Non-Interferometric Techniques for X-ray Phase-Contrast Biomedical Imaging" In **Handbook of X-ray Imaging Physics and Technology, 2018**. CRC Press, Taylor & Francis Group, Ed. Paolo Russo, CRC Press, Boca Raton, Florida (USA)
2. Peng Y, Liu C, Bravin A, Wang L, et al. "Synchrotron Radiation Applications in Medicine" In **Synchrotron Radiation Applications, 2018**. World Scientific Publishing, Ed. Xinyi Zhang, ISBN: 978-981-3227-66-8

According to law 679/2016 of the Regulation of the European Parliament of 27th April 2016, I hereby express my consent to process and use my data included in this CV.

Milano, 20 Febbraio 2022