Assoc.-Prof. Dipl.-Ing. **Francesco MOSCATO**, PhD

PERSONAL INFORMATION / CONTACTS

Born:
Position: Associate professor
Medical University of Vienna
Center for Medical Physics and Biomedical Engineering

https://orcid.org/0000-0003-0279-6615
ORCID: https://www.meduniwien.ac.at/researcher/francesco_moscato
Webpages: https://mpbmt.meduniwien.ac.at/en/research/medical-additive-manufacturing/https://mpbmt.meduniwien.ac.at/en/research/cardiovascular-engineering/

Publications: https://www.scopus.com/authid/detail.uri?authorId=55493320400

HIGHER EDUCATION / ACADEMIC QUALIFICATION

2024	**National Scientific Qualification as Full Professor** in the Italian Higher Education System (*Abilitazione Scientifica Nazionale*, Ministero dell'Università e della Ricerca)
2008	**Doctor of Philosophy (PhD)** in Mechanical Engineering (ING-IND34, Bioingegneria Industriale – Industrial Bioengineering) with distinction. Dept. of Mechanical Engineering, University of Calabria, Italy. Date of promotion: 07.02.2008.
2004	**Master of Science in Mechanical Engineering (MSc)** with distinction (110/110 e lode). Dept. of Mechanical Engineering, University of Calabria, Italy.

CAREER DEVELOPMENT (CURRENT AND PREVIOUS POSITIONS)

2015 – present	**Associate Professor** at the Center for Medical Physics and Biomedical Engineering, Medical University of Vienna, Austria
2014	Visiting researcher (6 months) at the Dept. of Chemical Engineering, Columbia University, New Work, NY, USA
2012 – 2015	Assistant professor at the Center for Medical Physics and Biomedical Engineering, Medical University of Vienna, Austria.
2010	Visiting lecturer (1 month) at the Dept. of Chemical Engineering, Columbia University, New Work, NY, USA.
2009 – 2012	Post-doc & University assistant at the Center for Medical Physics and Biomedical Engineering, Medical University of Vienna, Austria.
2008 – 2009	Post-doc at the Dept. of Mechanical Engineering, University of Calabria, Italy.
2006 – 2007	Visiting researcher during the PhD studies at the former Center for Biomedical Engineering and Physics, Medical University of Vienna, Austria.
2004	Qualifying examination to Italian Professional Engineering Society.
2003 – 2004	Visiting researcher during the Master studies at the Dept. of Informatics, Systems and Production, University of Rome – Tor Vergata, Italy.

RESEARCH FOCUS

My research focuses on two main areas Medical Additive Manufacturing and Cardiovascular Engineering:

- Medical device design and additive manufacturing, including in-silico, in-vitro and in-vivo tests
- Tissue engineering and biofabrication for next-generation implants with focus on microstructured surface patterns and lattice architectures
- Advanced patient-specific surgical simulators using 3D-printing and in-silico modeling

- Generative design of medical implants including metamaterials features
- AI-driven diagnostics for cardiovascular conditions (incl. transformer nets, XAI and NLP)
- Wearable devices for monitoring of cardiac patients and elderly (incl. hybrid printed electronics)
- Physiological closed-loop control of active (cardiovascular) medical devices
- Advancements in hydrodynamic flow behavior of cardiovascular devices by computational methods
- Neuroprosthetic solutions for cardiac function restoration through vagus-nerve stimulation

RESEARCH GRANTS

Overall funding volume: ca. 4 MioEUR

Period	*Funding source*	*Amount (Euros)*	*Grant Title*	*Role of applicant*	*Field of research*
2023-2025	Austria Wirtschafts Service (aws)	35.000	New patient-specific surgical simulator (SIMIS)	PI	Vascular Surgery / Imaging / Additive Manufacturing
2022-2025	Austrian Research Promotion Agency (FFG)	246.066	Optimized Hydrodynamic Flow Behavior by Selective Surface Functionalization of Ceramic 3D Printed Rotodynamic Blood Pumps (OPTIFLOW-3D)	CO-PI*	Cardiovascular / Additive Manufacturing
2021-2024	Austrian Research Promotion Agency (FFG)	242.516	TEXtile integrated HYbrid Printed Electronics (TEX-hype)	CO-PI*	Cardiovascular / Biosignal Prcessing
2019-2024	European Commission (EU-H2020)	689.870,50	Ink-based hybrid multimaterial of next generation implants (INKplant)	CO-PI*	Additive Manufactuirng / Craniomaxillo-facial Implants
2019-2021	Medtronic plc.	91.394,21	Optimization of VAD implantation using 3D-modeling (VAD-PLAN-3D)	PI	Cardiovascular / Imaging
2019-2023	European Commission (EU-H2020)	695.977,50	A neuroprosthesis to restore the vagal-cardiac closed-loop connection after heart transplantation (NeuHeart)	CO-PI*	Cardiovascular / Neural Engineering
2017-2022	Austrian Research Promotion Agency (FFG)	1.627.827	Additve Manufacturing for medical research (M3dRES)	PI	Additive Manufacturing / Multiple surgical disciplines incl. cardiac
2013-2016	Austria Science Fund (FWF)	238.866,09	Continuous out-of-hospital monitoring of rotary blood pump patients (RBP Monitoring)	PI	Cardiovascular / Biosignal Processing
2011-2012	Österreichische Nationalbank Jubiläumsfonds (ÖNB)	42.000	Non-invasive continuous evaluation of cardiac diastolic function during mechanical cardiac assistance	CO-PI*	Cardiovascular / Biosignal Processing
2007-2008	POR Calabria 2000-2006, Tirocinio di Ricerca - Misura 3.7 Azione A	18.000	Data Analysis and Modeling for Cardiac Assist Devices	PI	Cardiovascular / Computational Modelling
2006-2007	Giovani Ricercatori (art.3 del D.M. 21 Giugno 1999)	4.000	Actuator System of Pulsatile Pumps for Biomedical Applications Based on a Servocontrolled Linear Motor	CO-PI*	Cardiovascular / In-vitro Modelling
* The indicated funding amount is the one managed as a PI					

AWARDS, PRIZES, SCHOLARSHIPS, FELLOWSHIPS

2025 - "Inventor of the Year 2024". Medical University of Vienna, Jan 15, 2025, Vienna, Austria.

2024 - "CEN-CENELEC Standards+Innovation Award 2024" European Committee for Standardization and European Committee for Electrotechnical Standardization, Dec 10 2025, Brussels, Belgium.
- Honours Award for Excellence in Teaching "Ehrenpreis für exzellente Lehre" at the 20th day of the Medical University, Mar 12 2024, Vienna, Austria

2015 - "Sezai Innovative Research Award" at the 23rd Congress of the International Society for Rotary Blood Pumps (ISRBP), Sept 27-29 2015, Dubrovnik, Croatia.

2013 - "ESAO-Wichtig-Award" at the XL Congress of the European Society for Artificial Organs (ESAO), Sept 11-14 2013, Glasgow, UK.

2008 - "Young Researcher Scholarship 2008" at the 16th Congress of the International Society for Rotary Blood Pumps (ISRBP), Oct 2-4 2008, Huston, Texas USA.

2008 - 3rd Excellence Academy Fellowship in Medical Technology, German Research Foundation. "Adaptive Implants in Medicine". Hanover Medical School, May 26-31 2008, Hanover, Germany.

2000 - European Union Scholarship Erasmus/Socrates, Fachhochschule Bochum, Germany.

TEACHING ACTIVITIES

Overall 118 between different seminars, practica and lectures series have been given since 2009 at the Medical University of Vienna (in average ca. 30 academic hours for each semester). Of these, 22 of these were evaluated from students with an average score of 5.68/6 (mean) and 5.91/6 (median), where 6 represent the best possible score.

2020 – present Medical University of Vienna, Austria. Courses "Steuerung und Regenlung in der Medizin" and "3D Printing and Digital Technologies in Hospitals" within the Medical Informatics Master Curriculum UN066 936

2019 – present Medical University of Vienna, Austria. Propaedeutic Lecture "Introduction to Medical Imaging and Biomedical Engineering" within the PhD UN094 and Dr.Sci.Med. UN790 Curricula

2017 – present Medical University of Vienna, Austria. Practical seminar course "3D-Printing in Medicine" within the Dr.Sci.Med. UN790 Curriculum

2010 & 2014 Columbia University in the City of New York, NY, USA. Visiting lecturer for the course "Artificial Organs" BMCH E-4810

2009 – present Medical University of Vienna, Austria. Seminars for the course "Biomedizinische Technik und künstliche Organe" (Biomedical Engineering and Artificial Organs) within the undergraduate UN202 Curriculum

2009 – present Medical University of Vienna, Austria. Lectures and Laboratory experiments for the course "Herz und Kreislauf, Blut und Gefäße" (Heart and circulation, blood and vessels) within the undergraduate UN202 Curriculum

2009 – present Medical University of Vienna, Austria. Basic Seminars, Journal Club & Doctoral Thesis Seminars within the Dr.Sci.Med. UN790 Curriculum

2009 – present University of Applied Sciences of Vienna (Fachhoschule Technikum Wien), Austria. Courses "Biomedical Engineering for Artificial Internal Organs", "Cardiovascular System Dynamics" and "Mathematical applications with MATLAB and Simulink"

2005 – 2008 University of Calabria, Dept. Of Mechanical Engineering, Italy. Teaching assistant for the course "Meccanica delle Vibrazioni" (Mechanical Vibrations)

2005 University of Calabria - Dept. Of Mechanical Engineering, Italy. Teaching assistant for the course "Biomacchine" (Artificial Organs)

2005 Chiesa Evangelica SILOE (I.P.F. Istituto Per la Famiglia Onlus) Rende, Italy. Seminars of "Acustica Applicata" (Applied Acoustics)

SUPERVISION OF MASTER AND DOCTORAL STUDENTS AND POSTDOC FELLOWS

2013 – present	Nr. of Postdocs = 3 past, 5 ongoing. All at the Medical University of Vienna, Austria (8)
2009 – present	Nr. of PhD Students = 11 completed, 6 ongoing. Medical University of Vienna, Austria (16), University of Bologna, Italy (1)
2005 – present	Nr. of Master Students = 51 completed, 10 ongoing. Medical University of Vienna, Austria (24), University of Applied Sciences of Vienna, Austria (12), Technical University of Vienna, Austria (5), Medical University of Innsbruck, Austria (1), Johannes Kepler University Linz, Austria (1) | Politecnico di Milano, Italy (5), Politecnico di Torino, Italy (4), Università di Parma, Italy (2), Università della Calabria, Italy (2), Umea University, Sweden (1), Università di Pisa, Italy (1), University Nova Lisboa, Portugal (1), University Cité Paris, France (1), University of Trento, Italy (1), RWTH Aachen , Germany (1)

ACTIVITIES IN SCIENTIFIC SOCIETIES / INTERNATIONAL SCIENTIFIC MEETINGS

2025	Scientific program chair for the 1st European Medical 3D Printing and Innovative Technologies Congress, Vienna, Austria.
2018, 2019, 2022, 2024	Scientific program chair for the Medical 3D Printing and Innovative Technologies Congress, Vienna, Austria.
2024 – present	Deputy Coordinator of the Vienna Center for Engineering in Medicine
2023 – present	Coordinator of the European Special Interest Group for 3D Technologies and Printing in Hospitals
2022 – present	Board Member of the Austrian Society for Biomedical Engineering
2020 – present	Member of the Austrian Cluster for Tissue Regeneration
2019 – 2024	Faculty Member of the Vienna Center for Engineering in Medicine
2019	Scientific program co-chair for the 27th Congress of the International Society for Mechanical Circulatory Support, Bologna, Italy.
2019 – 2021	Immediate Past President (member of the Executive Board) of the International Society for Mechanical Circulatory Support.
2018 – 2019	"Pioneer of Open Innovations in Science", Laboratory for Open Innovation in Sscience from the Ludwig Boltzmann Gesellschaft, Vienna, Austria.
2018 – 2019	President of the International Society for Mechanical Circulatory Support.
2017 – 2018	President Elect of the International Society for Mechanical Circulatory Support.
2013 – 2017	Secretary General of the International Society for Rotary Blood Pumps.
2012 – 2018	Elected Board Member of the European Society of Artificial Organs.
2012	Scientific program chair for the 20th Congress of the International Society for Rotary Blood Pumps, Istanbul, Turkey.
2011 – 2014	Elected Board Member of the International Society for Rotary Blood Pumps.
2011 – 2013	Executive member at large Europe of the American Society for Artificial Internal Organs FYI - For Young Innovators.
2010 – 2012	Coordinator of the young researchers' activities of the European Society of Artificial Organs (yESAO).

MEMBERSHIPS OF PROFESSIONAL SOCIETIES

2022-present	Founding Member of the European Special Interest Group for 3D Technologies and Printing in Hospitals
2012 – 2020	Member of the International Society for Heart and Lung Transplantation.
2011 – present	Member of the Austrian Society for Biomedical Engineering.
2009 – present	Member of the European Society of Artificial Organs.
2008 – present	Member of the International Society for Mechanical Circulatory Support (formerly ISRBP).

2007 – 2015 Member of the American Society for Artificial Internal Organs.
2005 – 2006 Member of the Society for Medical Innovation and Technology.
2004 – present Associate member of the Audio Engineering Society.
2004 – present Member of the Italian Professional Engineer Society.

EDITORIAL ACTIVITIES IN JOURNALS

2022 – present Editorial Board Member for the Journal 3D Printing in Medicine (Springer)
2022 – present Reviewing Board for the Artificial Organs Journal (Wiley InterScience)
2017 – present Associate Editor for the Journal Frontiers in Physiology: Medical Physics and Imaging (Frontiers Media S.A.)
2017 – 2022 Associate Editor for the Artificial Organs Journal (Wiley InterScience)
2015 – 2017 Co-Editor for the Artificial Organs Journal (Wiley InterScience)
2009 – present Reviewer for scientific journals including Artificial Organs (Wiley InterScience); IEEE Transactions on Biomedical Engineering (Institute of Electrical and Electronics Engineers); Journal of Biomechanics (Elsevier), Frontiers in Physiology (Frontieres Media S.A.), 3D Printing in Medicine (Springer), etc.

INVITED LECTURES (selection)

2024 - Engineering Devices, Implants and Surgical Procedures through Additive Manufacturing and Simulation. 19th Conference of the International Society for Applied Cardiovascular Biology, Vienna, Austria, Oct 5-8, 2024.
- Improving education through patient-specific physical and augmented reality simulations. 11th European-Japanese Cerebrovascular Congress, Vienna, Austria, June 27-29, 2024.
- Establishing 3D Technologies in a Hospital from the Perspective of the European Special Interest Group for 3D Printing in Hospitals. 3D Printing in Hospitals Forum. Leuven Belgium, Apr 18-19, 2024.
- 3D Printing and Simulation for Personalization of Cardiovascular Devices, Implants & Surgical Procedures. 11th Cardiovascaular Research Days. Weissensee, Austria. Jan 11-13, 2024.

2023 - Personalization of Devices, Implants and Surgical Procedures by 3D Printing Technology. 46th Conference of the Austrian Society for Surgical Research. Schladming, Austria. Nov 29-Dec 1, 2023.
- 3D Printing in European Hospitals: Opportunities, Challenges, and Actions. 49th Annual Congress of the European Society for Artificial Organs. Bergamo, Italy. Aug 29-Sept 1, 2023.
- Education through patient-specific physical and augmented-reality simulations. Hybrid Cerebrovascular Surgery and Intervention Symposium. Vienna, Austria, May 26-27, 2023
- Translation only via Start-Ups?… Or not? . Austrian Cluster for Tissue Regeneration Annual Conference. Linz, Austria. May 04, 2023
- Knowing the rules: MDR and Quality control applied to 3D Printing. European Society of Radiology / Foundation Course / Medical Imaging Informatics/3d | Online | March 22, 2023
- Additive Manufacturing from the scratch into the patient. 4th Vienna-ESTS Laryngotracheal Course. Vienna, Austria. March 2-4, 2023.

2022 -Trends in the personalized design and manufacturing of next generation implants. Vienna Center for Engineering in Medicine and European Society for Biomechanics Joint Workshop. Vienna, Austria. September 22-23, 2023.
- Medical additive manufacturing: Is it ready for broad clinical use? Tissue Engineering and Regenerative Medicine International Society. Krakow, Poland, June 28-July 1, 2022.

2021 -Applications and ongoing research of ceramic additive manufacturing in medicine. Ceramitec Conference. Munich, Germany, 15-16 September, 2021.

2020 - Overview of activities and results from the M3dRES infrastructure and the Tracheobronchial Stent project. Medical 3D-printing and Innovative Technologies Online Symposium. 3 Dec, 2020.

- Additive Fertigung in der Medizin: Vom Krankenbett zum Labortisch und zurück. 7th Austrian 3D Printing Forum. Vienna, Austria, 22 October, 2020.
- Grundlagen der 3D-Drucktechnologie und mögliche Anwendungen in der Orthopädie und Unfallchirurgie. 56. Jahrestagung der Österreichische Gesellschaft für Unfallchirurgie & 1. Jahrestagung der Österreichische Gesellschaft für Orthopädie und Traumatologie. Online 1-3 October, 2020.
- Functional and anatomical 3D-printed models for cardiovascular research and education. Keynote lecture at the "Additive Manufacturing Meets Medicine" Online Conference. 9-11 September, 2020.
- 3D Printing at the Point-of-Care: Cardiovascular perspective. 3D Printing in Medicine Course. Online, 15 July, 2020
- Additive manufacturing for medical research: From bed to bench and back. Austrian Cluster for Tissue Regeneration Annual Meeting. Vienna, Austria, 18 February, 2020.

2019 - Presidential Address at the 27th Annual Conference of the International Society for Mechanical Circulatory Support. Bologna, Italy, 21-23 October, 2019.
- Perspectives of Additive Manufacturing for Prosthetic Instrumentation. 13th Vienna International Workshop on Functional Electrical Stimulation. Vienna, Austria, 23-25 September 2019.
- Imaging and 3D modelling. Abbot User Meeting, Vienna, Austria. 21-22 June, 2019
- Pitfalls and successes of 3D printing in my hospital: Tips and tricks. 3D Printing in Medicine Course. Leuven, Belgium, 13-14 June, 2019
- 3D printing in cardiovascular medicine: what role will this play in the future? Jahrestagung Österreichische Kardiologische Gesellschafft. 29 May-1 June ,2019
- Additive Manufacturing for Medical Research: opportunities and challenges. Sechenov International Biomedical Summit. Moscow, Russia, 20-21 May 2019
- Creating a 3D printing lab in radiology. European Congress of Radiology. Vienna, Austria. 27 February-3 March, 2019.

2017 - Additive Manufacturing for Medical Research. Additive Manufacturing and Innovative Technologies Congress. Steyr, Austria. 28-29 September, 2017.
- 24/7 Beat-to-Beat Monitoring of VAD-Patients: Clinical Data Underline the Importance of Smart Pumps. Gordon Research Conference Assisted Circulation. Stowe, VT (USA), June 25-30, 2017

2016 - Smarter Pumps: Hemodynamic Monitoring and Physiological Control. 36th Annual Meeting of the International Society for Heart and Lung Transplantation, Washington DC (USA), Apr. 27-30, 2016.

2015 - Assessment of myocardial recovery and pump control strategies to enhance it: State of the art and beyond. XLII ESAO Congress, Leuven (Belgium), Sept 2-5 2015.
- Continuous hemodynamic monitoring of patients with a continuous-flow left ventricular assist device. 37th Annual International Conference of the IEEE-EMBS, Milan (Italy), August 25-29, 2015.
- Future Needs for Functional CLASS III Patients: The Engineering Perspective. 35th Annual Meeting of the International Society for Heart and Lung Transplantation, Nice (France), Apr 15-18 2015.

2014 - A mathematical approach to cardiac remodeling. XLI ESAO Congress, Rome (Italy), Sept 17-20 2014.

2013 - Physiological pump control for ventricular recovery: myth or reality? 21st Congress of the International Society for Rotary Blood Pumps, Yokohama (Japan), Sept 26-28 2013
- Noninvasive cardiovascular diagnostics in left ventricular assist device patients. BMT Congress. Graz (Austria), Sept 19-21, 2013.
- Physical Activity in Patients with Continuous Flow Left Ventricular Assist Devices. Gordon Research Seminar on Assisted Circulation, Barga, LU (Italy), June 22-23, 2013.

2012 - Pulsatility in Patients with Left Ventricular Assist Devices. 5th International congress Aortic Surgery and Anesthesia "How to do it", Milano (Italy), December 13-15, 2012.
- Advanced cardiovascular diagnostics from pump parameters only. European Society for Artificial Internal Organs XXXIX Congress, Rostock (Germany), September 26-29, 2012.

- Physical activity of Rotary Blood Pump Patients. 20th Congress of the International Society for Rotary Blood Pumps, Istanbul (Turkey), September 20-22, 2012.
- Intrinsic physiologic control with ventricular assist devices. American Society for Artificial Internal Organs – 58th annual conference, San Francisco (California, USA), June 13-16, 2012.

2011 - Physiologically responsive control and beyond. Gordon Research Conference on Assisted Circulation, Waterville Valley (New Hampshire USA), June 12-17, 2011.
- Patient monitoring and physiologically responsive control using rotary blood pumps. 45th Congress of the German Society of Biomedical Engineering, Freiburg (Germany), September 26-30, 2011.
- Current research trends and perspectives in cardiovascular regulation and physiologically responsive control. 7th Symposium on Mechanical Circulatory Support, Berlin (Germany), November 4-6, 2011.

2010 - Measurements that make sense for physiological modeling: System identifiability and the frequency content of measurements. European Society for Artificial Internal Organs XXXVII Congress, Skopje (Macedonia), September 8-11, 2010.

2009 - Control of a Rotary Blood Pumps for the Defined Training of the Assisted Ventricle. 17th Congress of the International Society for Rotary Blood Pumps, Singapore, October 1-3, 2009.

LANGUAGES

Italian:	mother tongue
English:	fluent (written and spoken)
German:	fluent (written and spoken)
Spanish:	good (spoken)

HOBBIES

Trekking and outdoor activities
Watercolor painting
Guitar playing and sound recording
Cooking

Vienna, Austria – March 14, 2025 Francesco Moscato