

PERSONAL
INFORMATIONS

Alessandro Bile



QUALIFICATIONS

PhD Student in Electromagnetism.

Master's Degree in Theoretical
Physics

Bachelor's Degree in Physics

Bachelor's Degree in Electronic Music

WORKING EXPERIENCE

01 September 2021 - 31
August 2022

Research fellowship related to the research project "**Intelligent optical systems for recognition and sanification of pathological micro-and nano-organisms**" at the Department of Basic and Applied Sciences for Engineering of the University of Rome "Sapienza", with scientific director Prof. Eugenio Fazio.

01 September 2019 - 31
August 2021

Research fellowship related to the research project "**Optical and optoelectronic systems for signal processing and monitoring of cultural heritage**" at the Department of Basic and Applied Sciences for Engineering of the University of Rome "Sapienza", with scientific director Prof. Eugenio Fazio.
<https://www.collectioncare.eu/about-us/>

2019-2022

PhD in Electromagnetics on the research project "**Design, modeling and implementation of intelligent hardware structures in the domain of optics**" at the Department of Basic and Applied Sciences for Engineering at the University of Rome "Sapienza"

2020-2021

University mentor / tutor of Physics, Mathematical Analysis, Computer Science and Programming at Camplus College Rome.

2020-2021

University mentor / tutor of Physics, Mathematical Analysis, Computer Science and Programming at Camplus College Bologna.

2020

Mentor at Digital Education Lab:
<https://www.digitaleducationlab.it/perche-scuola-educazione-digitale/il-team/>

Founder and designer of the Coding and Music course.

2019-2021

Grant for tutoring module "Physics 1" (FIS / 01) at the Faculty of Civil and Industrial Engineering at the University of Rome "Sapienza".

2019-2021

Grant for tutoring in the "Mathematical Analysis" module (MAT / 05) at the Faculty of Civil and Industrial Engineering at the "Sapienza" University of Rome.

2019	Exercises for Prof. Pia Astone for the Physics course at the Faculty of Pharmacy at the University of Rome "Sapienza".
2016-2021	Private lessons of Piano and Electronic Music.
2012-2021	Lezioni private di Matematica e Fisica a studenti di Liceo e di Università.
2012-2015	Private lessons of Mathematics and Physics for high school and university students.
2018	Participation in the "Opus" Concert as a Film Artist at the Roman Philharmonic Academy in Rome.
2018	Partecipazione al concerto "Many Lands: One voice" come Film Artist presso il teatro Symphonyspace di New York.
2017	Participation in the concert "Many Lands: One voice" as Film Artist at the Symphonyspace theater in New York
2017	Participation in the "Fuse" Concert as Film Artist at Di Menna Center in New York.

Settembre 2013

FUNDING, AWARDS AND ACKNOWLEDGMENTS

2020	Avvio alla ricerca , funding for young researchers. Project title: Photonic implementation of elementary units of artificial intelligence based on soliton guides. Funded by the "Sapienza" University of Rome. Reference: AR120172B7152382
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PUBLICATIONS

- 2021 **A. Bile**, F. Moratti, H. Tari, E. Fazio, *Supervised and unsupervised learning using a fully-plastic all-optical unit of artificial intelligence based on solitonic waveguides*, Neural Comput & Applic (2021). <https://doi.org/10.1007/s00521-021-06299-7>
- 2021 **A. Bile**, R. Pepino, E. Fazio, *Study of Magnetic Switch for Surface Plasmon Polariton Circuits*, AIP Advances (2021), Volume 11, issue 4. <https://doi.org/10.1063/5.0040674>
- 2021 M. Majidi, H. Tari, **A. Bile**, E. Fazio, *Development of sol-gel based carbon ceramic electrode modified by graphene oxide - polyporrole nano composite for simultaneous determination of uric acid and dopamine in presence of ascorbic acid*, International Journal of Scientific Engineering and Applied Science, Volume 7, issue 4 (221-222), 2021.
- 2021 F. Camponeschi, **A. Bile**, H. Tari, E. Fazio, *Plasmonic-Solitonic coupling structure*, International Journal of Scientific Engineering and Applied Science, Volume 7, issue 3 (162-167), 2021, ISSN: 2395-3470.
- 2021 H. Tari, **A. Bile**, F. Moratti, E. Fazio, *Implementation of neuromorphic activation function within Surface Plasmon Polariton circuits*, submitted to Plasmonics.
- 2021 B. Ianero, **A. Bile**, M. Alonzo, E. Fazio, *Stigmergic Electronic Gates and Networks*, submitted to Journal of Computational Electronics.
- 2021 **A. Bile**, R. Santoboni, S. Frasca, P. Astone, *Gravitational Music*, submitted to Journal of Creative Music Systems.

July 2019

E. Fazio, M. Alonzo, A. Belardini, **A. Bile**, C. Soci, *Stigmergic reinforcement learning using All-Optical solitonic X-junctions*, paper 83, OμS'19.

SCIENTIFIC CONFERENCES

December 2021

A. Bile, F. Frasca, A.M. Siani, E. Verticchio, E. Fazio, *Prediction of the microclimate through NAR and NARX neural networks: application to Rosenberg Castle, museum partner of the CollectionCare project*, CollectionCare Conference, Valencia, Spain.

December 2021

F. Frasca, E. Verticchio, **A. Bile**, E. Fazio, G. Favero, C. Chimenti, C. Conati Barbaro, A. Vulpiani, S. Lupi, A. Grinde, B. Escobar Soca, M. Zarzo, P. Merello, F.J. García-Diego, A.M. Siani, *Changing track in procedures for deploying microclimate sensor devices in museum environments: application to CollectionCare museums*, CollectionCare Conference, Valencia, Spain.

September 2021

E. Fazio, **A. Bile**, H. Tari, *Experimenting with optical plasticity in photonic machine learning - towards all-optical Artificial Intelligence*, EOSAM 2021, Rome, Italy.

February 2021

F. Frasca, E. Verticchio , **A. Bile**, E. Fazio, G. Favero, C. Chimenti, A. Vulpiani, A. Grinde , A.M. Siani, *Definition of allowable targets from indoor climate observations in exhibition rooms: the case study of the Rosenberg Castle (Denmark)* *Analysis of the indoor climate trends in exhibition rooms: the case study of the Rosenberg Castle (Denmark)*, presso 3° congresso dell' AISAM - Associazione Italiana di Scienze dell'Atmosfera e Meteorologia, Università de L'Aquila, Italia.

September 2020

A. Bile, F. Moratti, E. Fazio, *Photonic implementation of an elementary unit of artificial intelligence based on solitonic waveguides*, Orale presso ICOP2020 Italian Optics and Photonics Conference, all'Università di Parma, Italia.

September 2020

H. Tari, **A. Bile**, F. Moratti, E. Fazio, *Implementation of neuromorphic activation function within Surface Plasmon Polariton circuits*, presso ICOP2020 Italian Optics and Photonics Conference, all'Università di Parma, Italia.

September 2020

H. Tari, **A. Bile**, F. Moratti, E. Fazio, *Surface Plasmon Polariton neuromorphic circuit with sigmoid activation function*, presso 9th EPS-QEOD Europhoton, Czech Technical University, Praga, Repubblica Ceca.

January 2020

Relatore per il Rome Technical Meeting del progetto europeo Collection Care con titolo "Particulate Detectors to be used inside the Sensor Node".

July 2019

E. Fazio, M. Alonzo, A. Belardini, **A. Bile**, C. Soci, *Stigmergic reinforcement learning using All-Optical solitonic X-junctions*, paper 83, OμS'19.

SUPERVISOR ACADEMIC THESIS

January 2021

Co-supervisor of master's thesis in Electronic Engineering at the "Sapienza" University of Rome by candidate Federico Camponeschi Title of the work: "Hybrid plasmon-soliton nano-photonic interconnection".

December 2020

Co-supervisor of the bachelor thesis in Computer Engineering at the "Sapienza" University of Rome of the candidate Romolo D'Amico. Title of the work: "Development of a machine-learning system using LSTM networks for the analysis and predictions of historical data series".

October 2020

Co-supervisor of master's thesis in Nanotechnology Engineering at the "Sapienza" University of Rome of candidate Riccardo Pepino. Title of the work: "Study of a magnetic switch in circuits using surface plasmons-polaritons".

January 2020

Co-supervisor of master's thesis in Electronic Engineering at the "Sapienza" University of Rome of candidate Francesca Moratti. Title of the work: "Study of a neural photonic circuit".

HIGHER EDUCATION AND TRAINING

July 2019

"DataScience" certification, paid postgraduate training course Experis Academy, Bergamo.

24 January 2019

Master's degree in General Theoretical Physics at the Sapienza University of Rome, with 110/110 cum laude. Thesis title: "Objects detection and tracking". Speakers Prof. Pia Astone and Prof. Sergio Frasca.

24 March 2018

Bachelor's degree in Electronic Music with 110/110 evaluation at the Conservatory of Rome Santa Cecilia, with an experimental thesis entitled: "Gravitational Music".

17 October 2017

National Diploma 1st level Instructor, Personal Trainer.

2004-2017

Piano student at the "Sylvestro Ganassi" music school.

2013-2016

Bachelor's degree in Physics with 110/110 assessment at the "Sapienza" University of Rome. Thesis title: "Neutron capture therapy with boron". Supervisor Prof. Riccardo Faccini.

2008-2013

Classical high school diploma with 100/100 evaluation at the Liceo Classico Terenzio Mamiani in Rome.

Certifications

30 January 2021	Deep Learning with Matlab offerto da MathWorks.
11 September 2020	Certification in Technological Translator, organized by the Mathematical Office for Innovation and Businesses of the CNR
22 February 2020	Certification 24 CFU per l'insegnamento
23 October 2019	Certificazione online "Basic 3D Modeling using Blender" della IIT Bombay University.
7-11 October 2019	Winner of the "15th Advanced School on Computer Graphics for Cultural Heritage", organized by the Cineca office in Bologna. Course on "Computer Graphics and Deep Learning for Cultural Heritage" and achievement of the relative certification.
July 2019	Certificate "General training on the protection of health and safety at work" for attendance and for passing the final tests.
12 May 2019	EF test certification with 74/100, C2, Proficient evaluation.
March-April 2019	"Machine Learning" online certification Stanford University course.
25 August 2018	"Deep Learning Onramp" online certification, course offered by Mathworks Matlab.
2017-2018	Participation in Philosophy lessons with attached certificates at the Philosophy Festival of Modena, Carpi, Sassuolo.

PERSONAL SKILLS

Mother tongue Italian

Other languages

	UNDERSTANDING		SPOKEN SKILL		WRITTEN PRODUCTION
	Listening	Reading	Interaction	Oral Production	
English	C1	C2	C2	C1	C2
Spanish	A2	B1	A1	A1	B1

Communication skills

- Good communication skills acquired during the assignments of private lessons, held since 2012, and as a porter at the condominium "Le Rocchigiane" located in Rocca di Mezzo (AQ) in 2013.

Organizational and management skills

- Good organizational and management skills obtained while serving as departmental representative at the Santa Cecilia Music Conservatory and as a representative of doctoral students at the Department of Basic and Applied Sciences for Engineering in Rome.

Digital Skills

AUTOVALUTAZIONE

Information processing	Communication	Content Creation	Safety	Problem solving
Expert user	Expert user	Expert user	Expert user	EXPERT USER

	<ul style="list-style-type: none">▪ Good skills of office suite tools (word processor, spreadsheet, presentation software)▪ Good skills of digital sound processing programs acquired as a composer and sound engineer at the Santa Cecilia Conservatory of Music▪ Good skills of programs for digital image and video processing acquired as a film artist and video maker▪ Skills in Data Base- SqlServer TSql, Cloud- Azure, PowerBI, R language, Supervised Machine Learning, Unsupervised Machine Learning, Clustering & Recommendation, Predictive Maintenance, Azure Machine Learning, Big data with RevoScaleR, Python language, Deep Learning Computer vision, Time Series Classic and Deep Learning, Reinforcement learning, Analyzing Big data with Databricks▪ Skills in Graphics Comptuer: Blender▪ Deep Learning Skills for Cultural Heritage
Linguaggi di programmazione	<ul style="list-style-type: none">▪ In-depth knowledge of C, Matlab, R, COMSOL and Octave, Python▪ Good knowledge of Python, Processing, Max-Msp, PureData, Scratch▪ Basic knowledge of PERL
Altre competenze	<ul style="list-style-type: none">▪ Film Artist▪ Composer▪ Private teacher▪ Swimming: experienced swimmer, currently a member of the Master team of the Due Ponti Sporting Club▪ Ski: expert skier, former member of the Campo Felice Ski Club
Patente di guida	B A3
Privacy	I authorize the processing of my personal data pursuant to Legislative Decree 30 June 2003, n. 196 "Code regarding the protection of personal data".