ENRICO MASSIMILIANO ALLARIA

PERSONAL INFORMATION

Name	ENRICO MASSIMILIANO ALLARIA
Address	VIA SAN FRANCESCO D'ASSISI, 28 – 34100 TRIESTE (TS) ITALY
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E-mail	enrico.allaria@elettra.eu
Nationality	Italian, German and Argentinean
Date of birth	10, 01, 1973

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SUMMARY

Highly experienced Senior Scientist with over 20 years in research, specializing in Free Electron Laser (FEL) physics, design, commissioning, and operation. Proven leadership in coordinating international research projects (FERMI, FLASH2020+), managing teams, and developing advanced FEL capabilities, including seeded FELs and echo-enabled harmonic generation (EEHG). Extensive experience in machine physics, R&D coordination, experimental planning, and reporting. Seeking to leverage expertise in FEL science and project management in a challenging research environment.

WORK EXPERIENCE

• Dates	**FROM OCTOBER 2021**
• Name and address of employer	Elettra - Sincrotrone Trieste, Basovizza, Trieste ITALY
• Type of business or sector	Research
• Occupation or position held	Senior scientist
• Main activities and responsibilities	Member of the FERMI team, organizing experimental activities for the FEL user facility. Coordinating implementation efforts for the FERMI2.0 upgrade, aiming to extend the facility's tuning range down to 2 nm while preserving unique seeding capabilities.

• Dates	**FROM JULY 2020 TO SEPTEMBER 2021**
• Name and address of employer	DESY, Hamburg (Germany)
• Type of business or sector	Research
• Occupation or position held	Senior scientist
• Main activities and responsibilities	Led the FLASH2020+ upgrade project for the FLASH free-electron laser facility, supported by DESY and the German Federal Ministry of Education and Research. Coordinated a large team to develop an ambitious seeded FEL (60 nm to 4 nm) operating at the full repetition rate of the superconducting accelerator. Established project structure, documentation system, and quality assurance processes for the 4-year project.

• Dates	**FROM APRIL 2016 TO JUNE 2020**
• Name and address of employer	Elettra - Sincrotrone Trieste, Basovizza, Trieste ITALY
• Type of business or sector	Research
• Occupation or position held	Senior scientist
• Main activities and responsibilities	Served as Head of Machine Physics for FERMI (from January 2019), coordinating machine R&D, optimizing FEL performance, and developing new configurations for users. Managed the EEHG experimental project at FERMI (from September 2016), including overseeing modifications to the facility layout.

• Name and address of employer	SLAC National Accelerator Laboratory, Menlo Park, CA
• Type of business or sector	Research
• Dates; Position and Occupation	**July 2015**; visiting physicist; discussions and preliminary experiments on micro-bunching effects on LCLS.
• Dates; Position and Occupation	**July 2012**; visiting physicist; studies and simulations to investigate possibilities to enhance the capability of LCLS to emit harmonic radiation. Participate to machine studies shifts.

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• Dates; Position and Occupation	**April 2011 – May 2011**; visiting physicist; Studies and simulations to investigate different possibilities for the polarization control at LCLS free electron laser. Free electron laser simulations for the use of second harmonic after burned undulator in LCLS.
• Dates	**FROM APRIL 2008 TO JUNE 2016**
• Name and address of employer	Sincrotrone Trieste, Basovizza, Trieste ITALY
• Type of business or sector	Research
• Occupation or position held	Staff scientist
• Main activities and responsibilities	Member of the FERMI steering team and responsible for FEL studies (from 2013), proposing upgrades and reporting progress to advisory committees (MAC, SAC). Key member of the FERMI commissioning team (from 2010), planning and organizing accelerator and FEL commissioning phases. Responsible for FERMI Physics Liaison Support for FEL physics (from March 2009), coordinating FEL optimization studies and reporting to the Project Office.
• Dates	**FROM MARCH 2005 TO MARCH 2008**
• Name and address of employer	Sincrotrone Trieste, Basovizza, Trieste ITALY
• Type of business or sector	Research
• Occupation or position held	Research Collaborator
• Main activities and responsibilities	Contributed to FEL optimization studies within the FERMI project (from 2007). Participated in Storage Ring Free Electron Laser experimental activities (from 2005).
• Dates	**FROM SEPTEMBER 2003 TO MARCH 2005**
• Name and address of employer	University of Florence, Dept. of Physics
• Type of business or sector	Research, Education
• Occupation or position held	Research Collaborator
• Main activities and responsibilities	Collaborated within the Italian Research Project “Science and Technology in the society of Knowledge: Economics and Complexity”. Conducted experimental, theoretical, and numerical research on nonlinear laser dynamics. Guest researcher at University Rey Juan Carlos, Mostoles, Spain (Jan 2004 & Nov 2004). Co-prepared the funded Azione Integrata Italia-Spagna project (IT1348) on laser dynamics control. Assisted in managing the MIUR project for the Florence unit.
• Dates	**FROM SEPTEMBER 2000 TO SEPTEMBER 2003**
• Name and address of employer	Istituto Nazionale di Ottica Applicata, Firenze, Italy
• Type of business or sector	Research,
• Occupation or position held	Pre-Doc fellowship
• Main activities and responsibilities	Held fellowship within the European project "Control, Synchronization and Characterization of Spatially Extended Nonlinear Systems" (HPRN-CT-2000-00158). Performed experimental, theoretical, and numerical work on nonlinear laser dynamics. Co-prepared the funded Azione Integrata Italia-Spagna project (IT853) on nonlinear optical systems. Assisted in managing the ECC project for the INOA unit
• Dates	**FROM APRIL 2000 TO SEPTEMBER 2000**
• Name and address of employer	Istituto Nazionale di Ottica Applicata, Firenze, Italy
• Type of business or sector	Research,
• Occupation or position held	Scientific collaboration
• Main activities and responsibilities	Collaborated on CNR project studying synchronization in chaotic CO2 lasers.

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TEACHING EXPERIENCE

• Dates	**February 2025**
• Name of organisation	Centro de Investigaciones Opticas CiOP, La Plata (Argentina)
• Course	Sources for coherent EUV and X-ray radiation
• Class	Sources for coherent EUV and X-ray radiation (20 hours)
• Dates	**October 2024 – February 2025**
• Name of organisation	Accademia Nautica dell'Adriatico, Trieste (Italy)
• Course	T.S. del trasporto ferroviario e intermodale con qualifica di agente polifunzionale
• Class	Fondamenti di matematica e fisica applicati ai sistemi di trasporto (32 hours)
• Dates	**May 2016**
• Name of organisation	Ettore Majorana Foundation and Centre for Scientific Culture, Erice (Italy)
• Course	Erice School-Workshop "Trends in Free Electron Laser Physics"
• Lesson	FEL coherence and control of spectral properties
• Dates	**February 2013**
• Name of organisation	ICTP, Trieste (Italy)
• Course	Winter College on Optics: Trends in Laser Development and Multidisciplinary Applications to Science and Industry
• Lesson	Introduction to Free Electron Lasers

EDUCATION AND TRAINING

• Dates	**from 2003 to 2006**
• Name and type of organisation	University of Florence, Dept. of Engineering
• Principal subjects/occupational skills covered	Ph.D., "Nonlinear Dynamics and Complex Systems" Experimental and theoretical studies on control and synchronization of chaotic systems and lasers..
• Title of qualification awarded	**PhD. Degree**, April 2007
• Dates	**From 2000 to 2002**
• Name and type of organisation	University of Florence
• Principal subjects/occupational skills covered	Nonlinear dynamics studies on chaotic systems and laser
• Title of qualification awarded	**Specialization master on Optics**, December 2002
• Level in national classification	70 cum Laude (70 the best)
• Dates	**From 1992 to1999**
• Name and type of organisation	University of Florence
• Principal subjects/occupational skills covered	Physics career. The 1994-1995 academic year has been done at the University of Mainz in Germany in the framework of the European Project ERASMUS.
• Title of qualification awarded	**Degree in Physics**, April 2000
• Level in national classification	102 (110 the best)
• Dates	**From 1986 to1991**
• Name and type of organisation	Scientific high school P. Gobetti (Firenze),
• Principal subjects/occupational skills covered	Scientific high school
• Title of qualification awarded	**Diploma**, July 1991
• Level in national classification	42 (60 the best)

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AWARDS

August 2019: International Free Electron Laser Conference (FEL2019)

Awarded with the FEL prize "for his seminal contributions to seeded FELs including advanced operating modes in HGHG FEL as well as the first demonstration of EEHG FEL in the soft X-ray regime"

PROFESSIONAL SERVICES

Review Committees

- From Dec. 2023: Member of the Machine Advisory Committee for the SHINE light facility, SARI and Shanghai Tech University, Shanghai (China).
- December 2022: Reviewer at the International review on the physics design progress of the Shanghai HIgh repetitioN rate XFEL and Extreme (SHINE) accelerator and FEL schemes, SARI, Shanghai (China).
- 2015: Member of the Design Review Panel of the SINAP X-ray FEL Test facility SXFEL, SINAP Shanghai (China).
- 2014: Member of the International Commissioning Committee for the seeding at SACLA (Japan).

Conference and workshop Committees

- Member of the Scientific Program Committee for few editions of the International Free Electron Laser conference (2014, 2024).
- Member of the Scientific Program Committee for Conference of the Italian Synchrotron Light Society (SILS) 2024.
- Member of the Scientific Program Committee for the SPIE conferences "X-Ray Free-Electron Lasers: Advances in Source Development and Instrumentation"
- Member of the Scientific Committee for the Future of Seeded free Electron lasers (FUSEE) workshop organized by Elettra – Sincrotrone Trieste in 2022.

Referee

- Referee for scientific journals: Phys. Rev., Europ. Phys. Journ., D, Chaos, Opt. Commun., IEEE Jour. of Quant. Elect, Communications in Nonlinear Science and Numerical Simulation, Nature, Nature photonics, and others.
- Referee and evaluator for scientific proposal at funding agencies: ERC (EU), DOE (USA), SNF (Swiss), CAS (China), ANR (France).
- Referee for PhD and Master thesis at University of Milan, Trieste, Hamburg

PUBLICATIONS AND TALKS

Scientific publications

Authored more than 130 articles in reviewed journals. The full list can be accessed at the following links:

ORCID: https://orcid.org/0000-0001-9570-6361

Scopus: https://www.scopus.com/authid/detail.uri?authorId=6603817098

Five relevant publications are listed here:

- Strong-field quantum control in the extreme ultraviolet domain using pulse shaping, F. Richter et al., Nature 636, 13512, (2024)
- Nonlinear harmonics of a seeded free-electron laser as a coherent and ultrafast probe to investigate matter at the water window and beyond, G. Penco et al., Physical Review A 105(5),053524 (2022).
- Coherent soft X-ray pulses from an echo-enabled harmonic generation free-electron laser, P. Rebernik Ribič, et al., Nature Photonics, 13(8) (2019).
- Coherent control with a short-wavelength free-electron laser, K.C. Prince et al., Nature Photonics, 10(3), (2016).
- The FERMI free-electron lasers, E. Allaria et al., Journal of Synchrotron Radiation, 22 (2015).

Talks at Conferences and workshop

I have reported my work at various international conferences and workshops with invited and contributed talks

PERSONAL SKILLS AND COMPETENCES.

MOTHER TONGUE **ITALIAN**

OTHER LANGUAGES

	SPANISH	**ENGLISH**	**FRENCH**	**GERMAN**
• Reading skills	Excellent	Good	Good	Basic
• Writing skills	Good	Good	Good	Minimal
• Verbal skills	Excellent	Good	Good	Basic

TEACHING . I have taught a number of courses on FEL and synchrotron radiation schools.
I have been supervisor and co-supervisor for Master and PhD thesis and have followed the work of other students at INOA and FERMI. Referee for PhD thesis on the field of Free Electron Lasers.

SOCIAL SKILLS AND COMPETENCES Experience in international teams and collaborations; scientific outreach (guided tours) activities.

ORGANIZATIONAL SKILLS AND COMPETENCES Project leadership (FLASH2020+), team coordination, R&D planning, documentation systems, quality assurance, reporting.

TECHNICAL SKILLS AND COMPETENCES TANGO control system; Windows, Linux, MacOS; Office Automation (MS Office, Open Office); Data analysis (Origin, Matlab, Igor); Programming (Python, Fortran, C, Matlab, LabView); FEL simulation codes (GINGER, GENESIS).

ARTISTIC SKILLS AND COMPETENCES hiking, biking, running

DRIVING LICENCE(S) Italian driving license A and B

Trieste March 22th 2025

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