



Europass Curriculum Vitae

Personal information

First name(s) / Surname(s)	GiuseppeDattoli
Work Address	ENEA Centro Ricerche Frascati, Via E. Fermi, 45 00045 Frascati (Rome) Italy
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E-mail	Giuseppe.dattoli@enea.it
Nationality	Italian
Date of birth	
Gender	Male

Professional Career

Dates	2016-2020
Occupation or position held	Director Senior Scientist at ENEA Fusion Department
Main activities and responsibilities	Responsible of the CARM project task force. Theory of relativistic wave equations and development of new methods for the relevant solution. Development of the theory of Cyclotron Auto Resonance Maser (CARM), Task Force leader for the design of a new source of coherent radiation in the microwave range for plasma heating experiments and coordinator of the Conceptual Design Report, and from 2015 to 2019 Responsible (for ENEA) of the EUPRAXIA EU project and Responsible for ENEA of the FEL SPARC project.
Dates	2010-2015
Occupation or position held	Director of the unit of Mathematical models at ENEA FRASCATI CENTER
Main activities and responsibilities	Development of symbolic computational methods for the solution of Evolution equations and of transport equations and Energetic Models for cancer mass evolution. Theory of Undulator Free Electron Laser-Design of new operating Schemes-Theory of Instabilities in high current density accelerators-High Quality electron beam transport.
Dates	2011
Occupation or position held	Visiting professor at university Paris XIII
Main activities and responsibilities	Theory of indicial umbral calculus-Design of X-ray Free Electron Laser and study of the relevant performances-Study of non linear Harmonic generation in Free Electron Laser.

Dates	1994-2010
Occupation or position held	Director of the Unit of Theoretical Physics and applied Mathematics at ENEA FRASCATI CENTER
Main activities and responsibilities	Responsible for ENEA of the FEL SPARC project Design of SPARX FEL facility. Development of symbolic computational methods for the solution of Evolution equations and of transport equations. Development of MAGNETIC undulators- study of exotic undulators and theory of FEL operating with biharmonicundulators.
Dates	1990-1995
Occupation or position held	Responsible (for ENEA) of the FEL project for the fusion program with heavy ions
Main activities and responsibilities	Design of FEL operating in the VUV region of the spectrum-Study of FEL operating with Storage Ring Theory of high gain FEL and of FEL instability Theory of Saw Tooth instability Theory of Instability Suppression and Landau Damping.
Dates	1985-1990
Occupation or position held	Responsible for ENEA of the Cerenkov FEL in collaboration with Dartmouth college
Main activities and responsibilities	Development of new experimental lines for Cerenkov FEL and realization of the first FEL source operating with microtron at the ENEA Frascati Center. Development of FEL design theory.
Dates	1984
Occupation or position held	Visiting Scientist at Dartmouth College (Dartmouth, N. H. USA)
Main activities and responsibilities	Theory of Cerenkov Free Electron Laser-Development of FEL Quantum –Realization of A Cerenkov FEL at the ENEA Frascati centre.
Dates	1983
Occupation or position held	Visiting Scientist at university of California at Santa Barbara.
Main activities and responsibilities	Theory of FEL oscillators, modelling of Santa-Barbara FIR experiment Study of FEL oscillators operating at higher harmonics and design of a Cerenkov FEL to be operated at the ENEA RFRASCATI centre.
Dates	1982
Occupation or position held	Visiting Scientist at Stanford University
Main activities and responsibilities	Classical FEL theory, Theory of Mode locked FEL, theory of FEL super-modes , development of FEL design theories, development of techniques for the solution of time dependent Schroedinger equation.
Dates	1979
Occupation or position held	Visiting Lecturer at the International Center of Theoretical Physics (Trieste)
Main activities and responsibilities	Classical Free Electron Theory.
Dates	1979-1982
Occupation or position held	Staff Member at CNEN
Main activities and responsibilities	Theory of FEL and Design of FEL operating in the IR region with microtrons, study of the radiation emitted by relativistic in magnetic undulators-FEL oscillator design.
Dates	1977-1978
Occupation or position held	Fellowship at CNEN (now Enea)
Main activities and responsibilities	Theory of Free Electron Laser (FEL) and participation at the LEDA project (design of a Storage Ring FEL) .
Dates	1976-1977
Occupation or position held	INFN-LNF ASSOCIATE
Main activities and responsibilities	Physics of high energy, properties of Charmed Hadrons and development of group theoretical particle classification.

Education and training

Dates	1976-1977
Title of qualification awarded	Postgraduate School in High Energy Physics
Principal subjects/occupational skills covered	High Energy Physics Theoretical and Experimental
Name and type of organisation providing education and training	University of Rome La Sapienza – Italy
Dates	1971-1976
Title of qualification awarded	Laurea Degree (cum laude) in Physics
Principal subjects/occupational skills covered	Thesis c/o Laboratori Nazionali di Frascati, LADON PROJECT, and work on Nuclear structure, nucleon structure and of electromagnetic properties of Charmed Hadron
Name and type of organisation providing education and training	University of Rome La Sapienza – Italy

Participation to committees

Dates	2017-2020
committee	Member of ENEA Scientific Technical Committee.
Dates	2003-2008
committee	Member of ARPA LAZIO technical board.
Dates	2008-2012
committee	Member of INFN board of directors.
Dates	2000-2007
committee	Member of SPARX project technical board.
Dates	1994-1998
committee	Member of Inertial Fusion with heavy ions project technical board.
Dates	Rome August 1994
committee	Co-chairman of 1996 International FEL conference.

Professor Adjunct

Dates	2000-2016
	Courses at Rome University, La Sapienza (Roma) – Italy (Department of Medicina e Chirurgia)
	<ul style="list-style-type: none">- General Physics (Undergraduate Level)- Technical Physics (Graduate Level)- Elementary Calculus (undergraduatelevel)
Dates	2008-2009
	Courses at Third Rome University –Italy (Department of Physics)
	<ul style="list-style-type: none">- Group Theory (Graduate Level)- Mathematical Methods for Physics- Physics of Free Electron Laser

Dates 2003
 Course of at Rome University La Sapienza (Roma) Italy - (Physics Department)
 - Physics of Accelerators

Dates 1988
 Coruse at Napoli University Federico II - Italy
 - Free Electron Lasers (Specialistic Course)

Awards

Dates 1978
 committee Recipient prize of Italian Society of Physics for young Scientists.

Dates 1994
 committee Recipient of the International FEL prize.

Supervisor Activity

Advisor of 20 Laurea thesis in Physics and Mathematics and of 2 P.h.D. thesis

Personal skills and competences

Mother tongue(s) **Italian**

Other language(s)

Self-assessment
European level ()*

English

French

Understanding				Speaking				Writing	
Listening		Reading		Spoken interaction		Spoken production			
C2	Proficient user	C2	Proficient user	C2	Proficient user	C2	Proficient user	C2	Proficient user
C1	Proficient user	C1	Proficient user	C1	Proficient user	C2	Proficient user	B2	Independent user

**Scientific publications
 1977-2000**

Author of about 1000 papers on peer reviewed journals covering different aspects of physics and technology of accelerators, of lasers and Free Electron Lasers. A significant part of them is also devoted to mathematical physics and new computation techniques, including symbolic languages.

A partial list summarizing 43 years of scientific career is given below

PEER-REVIEWED JOURNAL ARTICLES

G. Dattoli, G. Matone and D. Prospero, Hadronpolarizabilities and quark models, Lett. Nuovo Cimento, 19, 601 (1977)

G. Dattoli and A. Renieri, Storage Ring operation of the Free Electron Laser: The oscillator, Il NuovoCimento 59-B, 1 (1980)

G. Dattoli, A. Marino, A. Renieri and F. Romanelli, Progress in the Hamiltonian Picture of Free Electron Laser, IEEE-JQE 17, 1371 (1981)

G. Dattoli, S. Solimeno and A. Torre, Algebraic time-ordering techniques and harmonic oscillator with time-dependent frequency, Phys. Rev. A , 34, 2646 (1984)

W. B. Colson, G. Dattoli and F. Ciocci, Angular-Gain Spectrum in Free Electron Laser, Phys. Rev. A 31828 (1985)

G. Dattoli, J. C. Gallardo and A. Torre, Binomial Sates of the Quantized Radiation Field: A Comment, JOSA B-4, 185 (1987)

- G. Dattoli, J. C. Gallardo and A. Torre, An Algebraic View to Operator Ordering and to its Application in Optics, *La Rivista del NuovoCimento* Vol. 11-1 (1988)
- G. Dattoli, R. Mignani and A. Torre, Non Hermitian Evolution of two-level quantum systems, *Phys. Rev. A* 42, 1467 (1990).
- F. Ciocci, G. Dattoli, A. De Angelis, B. Faatz , F. Garosi, L. Giannessi, P. L. Ottaviani and A. Torre, Design Considerations of a High power VUV FEL, *IEEE-JQE* 31, 1242 (1995)
- G. Dattoli, P. L. Ottaviani, A. Torre and L. Vazquez, Evolution operator equations: Integration with algebraic and finite difference methods. Applications to physical problems in classical and quantum mechanics and quantum field theory, *La Rivista del NuovoCimento*, vol. 20-1, (1997)
- G. Dattoli and P. L. Ottaviani, Semi analytical models of free electron laser saturation, *Optics Commun.* 204, 283 (2002)
- G. Dattoli, C. Guiot, P. P. Delsanto, P. L. Ottaviani, S. Pagnutti, T. S. Deisboeck, Cancer Metabolism and Dynamics of metastasis, *Journal of theoretical biology*, (2008)
- D. Babusci, G. Dattoli and M. Quattromini, Relativistic equations with fractional and pseudo-differential operators, *Phys. Rev.* 83- A (2011)
- G. Dattoli, K. Gorska, K. Penson, D. Babusci and G. H. E. Duchamp, Operator Solution for Fractional Fokker Planck equations, *Phys. Rev. E*, 85, 031138 (2012)
- M. Artioli and G. Dattoli, "The Geometry of Hermite Polynomials"
<http://demonstrations.wolfram.com/TheGeometryOfHermitePolynomials/> Wolfram Demonstrations Project Published: March 4, 2015
- E. Di Palma, G. Dattoli, E. Sabia, S. Sabchevski and I. Spassovsky, "Beam-wave interaction from FEL to CARM and associated scaling laws", *IEEE Transection on Electron Device*, Vol. 99, 21August 2017, pp.1-8.
- G. Dattoli, E. Di Palma, S. Pagnutti, E. Sabia, "Free Electron Coherent Sources: from Microwave to X-rays", *Physics Reports (A Review Section of Physics Letters)* 739 (2018), 1-51.

BOOKS AUTHOR

- D. Babusci, G. Dattoli, S. Licciardi and E. Sabia " Mathematical Methods For Physicists" World Scientific (Singapore) 2019
- G. Dattoli, A. Doria, E. Sabia and M. Artioli, Charged Beam Dynamics, Particle Accelerators and Free Electron Lasers (IOP Expanding Physics) (English Edition) IOP publishing 2017
- M. Artioli e G. Dattoli, *Appunti di Relatività Ristretta*, Aracne Editrice Rome (2013)
- F. Ciocci, G. Dattoli and A. Boccia, *Lezioni di Calcolo*, Edizioni universitarie Kappa (2009)
- F. Ciocci, G. Dattoli, A. Torre and A. Renieri, *InsertionDevices*, World Scientific (2000)
- G. Dattoli and A. Torre *Theory and Application of Generalized Bessel Functions*, AracneEditrice (Rome) (1996)
- G. Dattoli, A. Renieri and A. Torre, *Lectures on Free Electron Laser Theory and on Related Topics*, World Scientific, (1995)
- G. Dattoli and A. Torre "Theory of Generalized Bessel functions and applications to electromagnetic problems" Aracneeditrice (Rome) 1990

G. Dattoli and A. Renieri, Theoretical and Experimental Aspects of Free Electron Laser, In Laser Handbook Vol. IV ed. by M. L. Stitch and M. Bass, North Holland (1985).

In preparation

G. Dattoli and S. Licciard “Umbral Methods and Special Functions” (to be published by World Scientific Singapore in 2021)

G. Dattoli, E. Di Palma, S. Sebagevsky and I. Spassovsky, High Frequency Coherent Radiation Sources and Applications to Fusion Plasmas (to be published by IOP Expanding Physics in 2021)

G. Dattoli, A. Petralia, V. Pettillo, S. G. Biedron and S. V. Milton, Elements of Quantum Mechanics (to be published by Taylorand Francis in 2022)