Curriculum Vitae

Giacomo Grasso, born on February 10, 1980 in Reggio Calabria (RC), ITALY; resident in v. Reggio Campi II tronco, 3, 89100 Reggio Calabria (RC), living in v. f.lli Ruffini, 1, 42100 Reggio Emilia (RE).
Phone: +39-0522-558416 E-mail: giacomo.grasso@enea.it
Mobile: +39-349-5660427 Website: http://www.afs.enea.it/ggrasso/

CURRENT POSITION

December 23, 2010 – in progress
Italian National Agency for the New Technologies, Energy and Sustainable Economic Development (ENEA), Bologna, ITALY. Researcher in nuclear reactor physics, reactor core design and fuel cycle scenario studies.

EDUCATION

May 17, 2010
Department of Energy and Nuclear Engineering and of Environmental Control (DIENCA) - Alma Mater Studiorum University, Bologna, ITALY. PhD in nuclear engineering with a dissertation on "Neutronics Analysis for Fast Spectrum Nuclear Systems and Scenario Studies for Advanced Nuclear Fuel Cycles", in collaboration with ENEA.

October 19 – 21, 2009
Aix-en-Provence, FRANCE. Participation to the "2nd ERANOS users' Workshop".

June 18 – 29, 2007
Interuniversity Consortium for the Automatic Computing of North East Italy (CINECA), Casalecchio di Reno (BO), ITALY. Participation to the "7th Summer School of Scientific Visualization and 3D Interactive Graphics".

October 9 – 13, 2006
CINECA, Casalecchio di Reno (BO), ITALY. Participation to the "2nd Specialized School of Parallel Computing".

September 4 – 15, 2006
CINECA, Casalecchio di Reno (BO), ITALY. Participation to the "15th Summer School of Parallel Computing".

June 22, 2006
Alma Mater Studiorum University, Bologna, ITALY. M.S. degree with honors in Nuclear Engineering. Advisor: prof. Marco Sumini. Dissertation: Application of Particle In Cell methods to the modeling of the plasma dynamics in Plasma Focus devices.

1998
"Liceo" specializing in classical and scientific studies "Ariosto-Spallanzani", Reggio Emilia, ITALY. Scientific school-leaving certificate with honors.

FOREIGN LANGUAGES

Good knowledge of both spoken and written English.

PROFESSIONAL EXPERIENCE

November 11 – December 22, 2010
Alma Mater Foundation, Bologna, ITALY. Occasional independent work contract for the "Study of beam transport from the optic accelerator to LINAC".

September 1 – December 22, 2010
SIET S.p.a., Piacenza, ITALY. Occasional independent work contract for "Studies for the conceptualization and characterization of models and analyses of static and kinetic neutronic parameters for a LFR-type nuclear reactor and its demonstrators".

September 1 – November 30, 2010
Alma Mater S.r.l., Bologna, ITALY. Occasional independent work contract for the "Finalization of a parallel Particle In Cell code with Monte Carlo Collisional module for simulating the process of formation of the plasma sheath in a Plasma Focus device".

January 21 – May 21, 2010
Alma Mater S.r.l., Bologna, ITALY. Occasional independent work contract for the "Set up of codes for simulating breakdown processes by Particle In Cell (PIC) and Monte Carlo techniques".

May 1 – July 31, 2007
CINECA, Casalecchio di Reno (BO), ITALY. Stage for the study and the application of parallelization techniques to scientific code.

October 11 - November 30, 2006
DIENCA - Alma Mater Studiorum University, Bologna, ITALY. Occasional independent work contract for the "Execution of simulation calculations of plasmas in Plasma Focus machines" by means of the proprietary code ***es-c*PIF**.

ADDITIONAL PROFESSIONAL EXPERIENCES

December 1 – 21, 2010
"Alma Mater Studiorum" – University of Bologna, Bologna, ITALY. Contract professor for a 20 hours cycle of lessons regarding "Deterministic and Monte Carlo codes applied to neutronics", within the "Design and management of advanced nuclear systems" Master course.

October – December, 2010
"Alma Mater Studiorum" – University of Bologna, Bologna, ITALY. Contract professor within the "Neutronics and Plasmas" teaching of the "Energy engineering" MS course.

March – June, 2010
"Alma Mater Studiorum" – University of Bologna, Bologna, ITALY. Contract professor within the "Radioprotection" teaching of the "Energy engineering" MS course.

October – December, 2009
"Alma Mater Studiorum" – University of Bologna, Bologna, ITALY. Contract professor within the "Neutronics and Plasmas" teaching of the "Energy engineering" MS course.

November 1 – 30, 2009
"Alma Mater Studiorum" – University of Bologna, Bologna, ITALY. Contract professor for a 20 hours cycle of lessons regarding "Deterministic and Monte Carlo codes applied to neutronics", within the "Design and management of advanced nuclear systems" Master course.

July 1, 2009
ENEA, Bologna, ITALY. Invited speaker for the seminary "Neutronic design of a Lead Fast Reactor: general guidelines, aims and constraints", held within the "Virtual European Lead Laboratory" (VELLA) school, a EURATOM FP6 project.

February 10 – 28, 2009
"Alma Mater Studiorum" – University of Bologna, Bologna, ITALY. Contract professor for a 20 hours cycle of lessons regarding "Deterministic and Monte Carlo codes applied to neutronics", within the "Design and management of advanced nuclear systems" Master course.

October 9, 2008
CINECA, Casalecchio di Reno (BO), ITALY. Invited speaker for the seminary "Structured Adaptive Mesh Refinement: an introduction to SAMRAI", held within the "4th Specialized School of Parallel Computing".

May 10 – 19, 2008
Design, preparation and management of the laboratory exhibition "A Tempo di Fisica" ("In Physics Time") about the concept of time and its measurement, within the II edition of the "In forma di scienza" ("Science-shaped") festival, organized by the Scandiano Commune, the "L. Spallanzani" Studies Center, the University of Modena and Reggio Emilia and the "Levi Montalcini" Association at the "Rocca del Boiardo", in Scandiano (RE).

March 1 – April 30, 2008
Presentation of the didactic project "The small laboratory: in physics time", articulated into five laboratories one-hour each long, to 5 second classes of the elementary schools of the didactic circle of Scandiano (RE).

October 8, 2007
CINECA, Casalecchio di Reno (BO), ITALY. Invited speaker for the seminary "Structured Adaptive Mesh Refinement: an introduction to SAMRAI", held within the "3rd Specialized School of Parallel Computing".

May 7 – 14, 2006
Design, preparation and management of the laboratory exhibition "Sei pezzi facili" ("Six easy pieces") about optics and light properties, within the I edition of the "In forma di scienza" ("Science-shaped") festival, organized by the Scandiano Commune, the "L. Spallanzani" Studies Center, the University of Modena and Reggio Emilia and the "Levi Montalcini" Association at the "Rocca del Boiardo", in Scandiano (RE).

November 1, 2005 – March 31, 2006
Presentation of the didactic project "The small laboratory: the physics of light", articulated into five experiences one-hour each long, to 10 first and second classes of the elementary schools of the didactic cycle of Correggio (RE).

2005 – 2006
Training activity for the project "Physics at Mirabilandia: a classroom without walls", held at the Mirabilandia (RA, ITALY) funfair:

- on behalf of the Association for the Didactics with the Technologies (ADT): May 30 – June 7, 2005;
- on behalf of "Parco della Standiana Srl": April 8 – June 30, 2006.

SCIENTIFIC AND INFORMATIC SKILLS

Excellent knowledge of the criteria for the neutronic design of fast-spectrum nuclear systems, with experience matured within the frame of the "ELSY" and "CDT" projects (respectively within the 6th and 7th EURATOM Framework Programme), and of the "DEMO" project (foreseen within the agreement between ENEA and the Italian Ministry of Economic Development).

Excellent knowledge of the main techniques for neutronic analysis of fast- and thermal-spectrum reactors, applied for supporting the design of such systems.

Excellent knowledge of the transport theory, focused to both neutrons transport in nuclear reactors and charged particles transport in plasmas.

Excellent knowledge of the general purpose Monte Carlo transport code MCNP5.

Optimal knowledge of the deterministic neutron transport code ERANOS.

Excellent knowledge of the COSI6 code for the management and optimization study of nuclear fuel cycles by scenarios simulation.

Good knowledge of the APOGENE code for generating reactor libraries for COSI starting from ERANOS simulations.

Excellent knowledge of numerical Particle In Cell (PIC) methods for microscopic simulation of many-body systems dynamics, and their coupling with Monte Carlo Collisional (MCC) modules. Creation and development of the ***es-c*PIF** (***e***lectro***s***tatic-***c***ollisional **P**article **I**n cell for plasma **F**ocus) code for the simulation of the electrical breakdown of Plasma Focus devices.

Good knowledge of numerical techniques for Structured Adaptive Mesh Refinement (SAMR). Excellent knowledge of the open source SAMR framework SAMRAI. Development of the **SAMR*es-c*PIF** (***e***lectro***s***tatic-***c***ollisional **P**article **I**n cell for plasma **F**ocus with **S**tructured **A**daptive **M**esh **R**efinement) code for the simulation of the electrical breakdown of Plasma Focus devices.

Good knowledge of the most common parallelization techniques by Message Passing Interface (MPI).

Optimal knowledge of optimization techniques for scientific code and of the supporting information tools Intel VTune (Windows-Linux), IBM hpm (AIX) and GNU gprof (Linux).

Excellent knowledge of Microsoft Windows and GNU/Linux operative systems.

Excellent knowledge of high level programming languages Fortran90 e C++.

Good knowledge of Microsoft Visual Studio (windows) e Trolltech Qt (linux) Integrated Development Environments (IDE).

Good knowledge of scientific code optimization techniques and of the related profiling tools Intel VTune (windows-linux), GNU gprof (linux) and IBM High Performance Monitor – HPM (IBM AIX).

Good knowledge of the mathematics development environment Mathworks Matlab.

Excellent knowledge of the scientific visualization software gnuplot.

Excellent knowledge of the typographic composition system TeX-LaTeX.

PUBLICATIONS

M. Frignani, **G. Grasso**, F. Rocchi and M. Sumini. PIC-MCC simulation of the electrical breakdown in a plasma focus device. In *Joint International Topical Meeting on Mathematics & Computation and Supercomputing in Nuclear Applications (M&C + SNA 2007)*, Monterey, California, April 15-19, 2007, on CD-ROM, American Nuclear Society, LaGrange Park, IL (2007).

C. Artioli, G. Glinatsis, S. Monti, M. Sarotto, **G. Grasso**, L. Monti, F. Rocchi, M. Sumini and J. Ghassoun. EFIT fuel cycle analysis by deterministic and Monte Carlo methods. In

First International Conference on Physics and Technology of Reactors and Applications (PHYTRA1), Marrakech, Morocco, March 14-16, 2007, on CD-ROM, (2007).

G. Grasso, F. Rocchi and M. Sumini. Development of a Particle In Cell code with Structured Adaptive Mesh Refinement for Plasma Focus devices breakdown simulation. In *Il Calcolo Scientifico nella Fisica Italiana (CSFI2008)*, Rimini and Senigallia, Italy, May 27-31, 2008.

R. Ghazy, E. Padovani, M. E. Ricotti, C. Artioli and **G. Grasso**. A Coolant Void Reactivity Evaluation of ELSY LFR: Optimization of a Mid-Plane Blanket for Void Effect Reduction. In *International Topical Meeting on Safety of Nuclear Installations 2008 (TopSafe 2008)*, Dubrovnik, Croatia, September 30-October 3, 2008.

G. Grasso, C. Artioli, S. Monti, F. Rocchi and M. Sumini. On the Effectiveness of the ELSY Project with respect to Burning and Transmutation Capabilities. In *Tenth Information Exchange Meeting on Actinide and Fission Product Partitioning and Transmutation (IEMPT10)*, Mito, Japan, October 6-10, 2008.

G. Grasso, M. Sumini, F. Rocchi and A. Tartari. Perspectives for the Application of Plasma Focus Technology to Neutron Capture Therapy. In *13th International Congress on Neutron Capture Therapy (13th ICNCT)*, Florence, Italy, November 3-7, 2008.

G. Grasso, F. Rocchi and M. Sumini. Development of a Particle In Cell code with Structured Adaptive Mesh Refinement for Plasma Focus devices breakdown simulation. *Il Nuovo Cimento* **32**C(2):147-51, DOI 10.1393/ncc/i2009-10390-y (2009).

C. Artioli, **G. Grasso** and M. Sarotto. ELSY Neutronic Analysis by deterministic and Monte Carlo methods: an innovative concept for the control rod systems. In *2009 International Congress on Advances in Nuclear Power Plants (ICAPP '09)*, Tokyo, Japan, May 10-14, 2009.

D. Gugiu, G. Glinatsis, **G. Grasso** and C. Artioli. Radiation damage and activation evaluations for the ELSY reactor. In *2009 Annual International Conference on Sustainable Development through Nuclear Research and Education (Nuclear 2009)*, Pitesti, Romania, May 27-29, 2009.

G. Glinatsis, D. Gugiu, **G. Grasso** and C. Petrovich. Nuclear data impact on the core neutron design. In *2009 Annual International Conference on Sustainable Development through Nuclear Research and Education (Nuclear 2009)*, Pitesti, Romania, May 27-29, 2009.

G. Grasso, M. Frignani, F. Rocchi and M. Sumini. Hierarchical Agglomerative Sub-Clustering technique for variance reduction in PIC simulations. In *Ions Acceleration with high Power Lasers: Physics and Applications (Coulomb '09)*, Senigallia, Italy, June 15-18, 2009.

S. Bortot, C. Artioli, **G. Grasso**, V. Peluso and M. E. Ricotti. Approach to a Preliminary Core Characterization of a Generation IV Lead-cooled Fast Reactor Demonstration Project: Goals and Rationales. In *14th International Conference on Emerging Nuclear Energy Systems (ICENES 2009)*, Ericeira, Portugal, June 29-July 3, 2009.

S. Bortot, M. E. Ricotti, P. Console Camprini, **G. Grasso**, C. Artioli and V. Peluso. Feedback Coefficients Evaluation for an Advanced LFR Demonstrative Reactor. In *International Conference on Nuclear Energy for New Europe 2009 (NENE '09)*, Bled, Slovenia, September 14-17, 2009.

C. Artioli, **G. Grasso**, M. Sarotto, S. Monti and E. Malambu. European Lead-cooled SYstem core design: an approach towards sustainability. In *International Conference on Fast Reactors and Related Fuel Cycles (FR09)*, Kyoto, Japan, December 7-11, 2009.

L. Barzotti, **G. Grasso**, F. Rocchi, M. Sumini and E. Greenspan. Deterministic analysis of the Encapsulated Nuclear Heat Source by the European transport code ERANOS. In *International Conference on Fast Reactors and Related Fuel Cycles (FR09)*, Kyoto, Japan, December 7-11, 2009.

G. Grasso, C. Oppici, F. Rocchi and M. Sumini. A Neutronics Study of the 1945 Haigerloch B-VIII Nuclear Reactor. *Phys. perspect.* **11**:318-35 (2009) DOI 10.1007/s00016-008-0396-0.

S. Bortot, C. Artioli, **G. Grasso**, V. Peluso and M. E. Ricotti. Preliminary Core Characterization of a Generation IV Lead Fast Reactor DEMO: Goals, Design Rationales and Options. *En. Conv. and Management* **51**:1806-1812 (2010) DOI 10.1016/ j.enconman.2010.02.005.

C. Petrovich, C. Artioli and **G. Grasso**. Solution of the equilibrium fuel vector in closed fuel cycles and application to a Lead Fast Reactor. In *International Conference on the PHYSics Of Reactors: advances in reactor physics to power the nuclear renaissance (PHYSOR2010)*, Pittsburgh, Pennsylvania, USA, May 9-14, 2010, on CD-ROM, American Nuclear Society, LaGrange Park, IL (2010) , ISBN: 978-0-89448-079-9.

S. Bortot, P. Console Camprini, **G. Grasso**, C. Artioli and S. Monti. Conceptual core design of a Generation-IV LFR demonstration plant. In *International Conference on the PHYSics Of Reactors: advances in reactor physics to power the nuclear renaissance (PHYSOR2010)*, Pittsburgh, Pennsylvania, USA, May 9-14, 2010, on CD-ROM, American Nuclear Society, LaGrange Park, IL (2010) , ISBN: 978-0-89448-079-9.

C. Artioli, **G. Grasso** and C. Petrovich. A new paradigm for core design aimed at the sustainability of nuclear energy: the solution of the extended equilibrium state. *Ann. Nucl. En.* **37**:915-922 (2010) DOI 10.1016/j.anucene.2010.03.016.

G. Grasso, M. Frignani, F. Rocchi and M. Sumini. Hierarchical Agglomerative Sub-Clustering technique for variance reduction in PIC simulations. *Nuclear Instruments and*

Methods in Physics Research - Section A **620**:56-62 (2010) DOI 10.1016/ j.nima.2010.01.060.

L. Cinotti, C. F. Smith, C. Artioli, **G. Grasso** and G. Corsini. Lead-cooled Fast Reactor (LFR) design: safety, neutronics, thermal-hydraulics, structural mechanics, fuel, core and plant design. In D. G. Cacuci (ed.). *Handbook of Nuclear Engineering*, Chapter 30, Springer, ISBN: 978-0387981307.

Bologna, February 17, 2011.