

CV di Maria Giuseppina Bisogni

(2014- ad oggi) Professore associato di ruolo, Dipartimento di Fisica, Univ. di Pisa

(2002- ad oggi) Incaricato di ricerca INFN, INFN sezione di Pisa

(2002-2014) Ricercatore di ruolo, Dipartimento di Fisica, Univ. di Pisa

(2001-2002) Post-Doc, Dipartimento di Fisica, Univ. di Pisa

(1999-2000) Specialista in Fisica Medica, Scuola di Specializzazione in Fisica Medica, Univ. di Pisa

(1996-1998) Dottorato di Ricerca in Fisica, Dipartimento di Fisica, Univ. di Pisa

(1994) Laurea in Fisica, Votazione finale: "110/110 cum laude", Dipartimento di Fisica, Univ. Di Pisa

L'attività di ricerca di Maria Giuseppina Bisogni e' caratterizzata dallo studio di rivelatori a stato solido e la loro applicazione nella diagnostica per immagini, in particolare alla mammografia digitale e alla tomografia ad emissione di positroni per la verifica dei trattamenti in adroterapia. Negli anni 1994-2000 la sua attività di ricerca è stata focalizzata principalmente sullo sviluppo e caratterizzazione di rivelatori a semiconduttore (pixel e microstrisce) per la radiografia digitale. Negli anni 2001 - 2005 Bisogni ha partecipato attivamente al progetto "Breast Cancer Imaging integrato" (IMI), il programma di ricerca e formazione finanziata dal MURST (ora Ministero della Pubblica Istruzione), sotto gli auspici della legge 46/82 art. 10. La ricerca aveva come obiettivo principale la realizzazione di sistemi innovativi per imaging morfologico e funzionale per lo screening, la diagnosi e il follow-up delle patologie tumorali del seno.

Dal 2006 Bisogni ha iniziato una ricerca volta allo sviluppo e all'applicazione di un nuovo fotorivelatore per imaging medicale, il fotomoltiplicatore al Silicio (SiPM). Dopo aver preso parte a questo progetto sin dalle prime fasi, la candidata ha partecipato attivamente allo sviluppo e la sperimentazione di sensori SiPM e coordinato nel corso degli anni il lavoro di un gruppo di giovani ricercatori.

Il risultato più importante ottenuto in questa ricerca è stato lo sviluppo di moduli di rivelazione innovativi (progetto INFN 4DMPET di cui il candidato era investigatore principale negli anni 2011-2013) costituiti da cristalli scintillanti letti da matrici SiPM ed elettronica integrata. Versioni opportunamente adattate di questi moduli vengono adesso utilizzate in uno scanner PET-MR dedicato alle ricerche di malattie psichiatriche (FP7 progetto TRIMAGE) e nel sistema PET INSIDE per verificare la qualità dei trattamenti utilizzati nell'adroterapia cancro. Maria Giuseppina Bisogni e' coordinatore nazionale del progetto INSIDE (MIUR PRIN2010-2011 PN . 2010P98A75) che ha costruito lo scanner PET INSIDE, ora in funzione presso il Centro Nazionale di Adroterapia Oncologica (CNAO), la più grande struttura di adroterapia in Italia.

Come spin-off del progetto TRIMAGE, Bisogni ha proposto e ora coordina per l'Università' di Pisa un progetto (NEOLITE, finanziato da fondi regionali POR FESR 2014-2020) per lo sviluppo di alimentatori innovativi in grado di operare in campi magnetici di uno scanner MR (fino a 7 T). Il progetto è svolto in collaborazione con CAEN SpA e AGE Scientific, due PMI toscane attive nel campo dell'elettronica e della strumentazione scientifica.

Principali Progetti finanziati

2016 2017 NEOLITE Nuove tecnologie elettroniche di alimentazione in ambiente ostile (POR FESR 2014 – 2020 BANDO 2: PROGETTI DI RICERCA E SVILUPPO DELLE PMI FASE 2, 1.88 M€)
project leader: CAEN Spa

Responsabile scientifico Uni Pisa: Maria Giuseppina Bisogni

2013-2016 INSIDE Innovative solutions for Dosimetry in Hadrontherapy (MIUR PRIN2010-2011, PN 2010P98A75, 1M€)

Collaboration: Uni Pisa, Uni Torino, Politecnico Bari, Uni Roma La Sapienza, INFN

Coordinatore nazionale: Maria Giuseppina Bisogni

2011-2013 4D-MPET Four Dimension Magnetic Compatible PET module (INFN project funded \cong 150k€)

Collaboration: INFN of Pisa, Bari, Perugia, Torino

Responsabile nazionale: Maria Giuseppina Bisogni

Pubblicazioni Rilevanti

1. Bisogni M G et al. INSIDE in-beam positron emission tomography system for particle range monitoring in hadrontherapy. *Journal of Medical Imaging*. 2017; 4(1):011005.
2. Piliero MA, Bisogni MG et al., Full-beam performances of a PET detector with synchrotron therapeutic proton beams, *Phys Med Biol*. 2016 Dec 7;61(23):N650-N666.
3. Piliero M A, Bisogni M G et al. First results of the INSIDE in-beam PET scanner for the on-line monitoring of particle therapy treatments. *JINST*. 2016 Dec; 11(12):C12011-C12011.
4. Piliero, M. A., Bisogni, M. G., Cerello, P., Del Guerra, A., Fiorina, E., Liu, B., . . . Wheadon, F (2015). Performance of a fast acquisition system for in-beam PET monitoring tested with clinical proton beams. *Nuclear Instruments and Methods in Physics Research, Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, 804, 163-166. doi:10.1016/j.nima.2015.09.034

Pisa, 20/04/2017

Maria Giuseppina Bisogni

CURRICULUM VITAE



PERSONAL INFORMATION

Name	AMATO ANTONINO SALVATORE
City of residence	Paternò (CT) - Italy
Office phone	+39 095 542361
E-mail	amato@lns.infn.it
Nationality	Italian
Year of birth	1961

WORK EXPERIENCE

- Dates From 1984 to present
- Name and address of employer **INFN – Laboratori Nazionali del Sud (LNS)**
Via Santa Sofia n.62 – 95123 Catania - Italy
- Position CTER (Collaboratore Tecnico Ente di Ricerca) – Level IV
- Main activities and responsibilities From 2012 to present: responsible of the "Electronics, Diagnostics and Automations (EDA)" group, belonging to the Service of "New Technologies for Accelerators"

AREAS OF EXPERTISE

- Electronics for the remote control of the LNS Superconducting Cyclotron and beam transport lines
- Electronics for beam diagnostics and high speed signals
- Diagnostic systems for a proton beam used in medical application
- Beam diagnostic for laser-driven ion beams
- Accurate measurements of low level DC current
- Quench detector system of the LNS Superconducting Cyclotron
- High voltage and high current power supplies
- Magnetic field measurement systems
- Electromagnetic compatibility

EDUCATION

- Dates From 1974 to 1979
- Name and type of institute State Professional Institute "Enrico Fermi" of Catania (Italy)
- Title of qualification awarded Technician of Electrical and Electronic Industries
- Marks obtained 60 / 60

SPOKEN LANGUAGES

Mother tongue Italian

Other languages

- English (fluent)
- Russian (low intermediate - ниже среднего уровня)

MAIN ACTIVITY

- *Accelerators Division* Deals with the ordinary maintenance and upgrading operations of the control systems for both the LNS superconducting cyclotron and the LNS beam transport lines.
- *ELIMED project* Participation in the design and construction of the remote control, beam diagnostics and dosimetry systems, for the ELIMED beamline that will be installed in December 2017 at the ELI-Beamlines (Extreme Light Infrastructure Beamlines) facility in Prague.
- *CATANA facility* Deals with the maintenance of the beam diagnostics, interlock and dosimetry systems, which are operating inside the proton therapy room dedicated for the treatment of ocular tumors.
- *MAGNEX spectrometer* Deals with the maintenance of the two main power supplies 245_kW each.

HISTORY

- *Superconducted Cyclotron* From middle of 1984 up to 1989 I worked in Milan for the construction of the Superconducted Cyclotron. In this period I joined the Computer Control group with the task of design and construct the: magnetic field mapping system; main console and its distributed control system; computer automation for the vacuum system.
With the arriving of the Superconducted Cyclotron in Catania (1990), I was responsible of :
 - 1) the TPS, which is a dedicated control station for the monitoring of all "Temperatures, Pressures and Stresses" in the different points of the cryostat ;
 - 2) "Quench Detection System" and "Interlocks System" which together take care for the safety of the two superconducting coils ;
 - 3) Beam diagnostics for the accelerating chamber.The quality of the work that has been done was proved by the fact that in December 1994 was extracted the first ion beam.
- *LNS Beam Trasport Lines* In 1994 I started to work for the construction of the computer control system devoted for the LNS beam transport lines. During this year I designed all front-end electronics for the readout of beam diagnostic devices, such as Beam Profile Monitors (based on two scanning wires) and Faraday-Cups. The quality of the work that was done in 1994 was proved by the fact that all systems were able to measure DC currents down to 1pA within a bandwidth of 100_Hz.
- *CATANA project* In 1996 started my collaboration with the working group who was in charge to build up, at LNS, a 70 MeV proton-therapy facility for the treatments of eye tumour. In this context I developed all low level electronics necessary for the beam diagnostics, dosimetry system included, to be installed inside the proton-therapy room. The quality of the work that has been done during that period is still proved by the fact that more than 350 patients have been successful treated from February 2002 up to now.
- *EXCYT project* From 2003 to 2009 I worked for this project, which goal was the production and acceleration of radioactive ion beams by means of a primary beam (accelerated by the LNS superconducting cyclotron) and a target-ion source located inside a high voltage platform. In this context I worked for: 1) the purchase of all power supplies necessary for the magnetic and electrostatic elements installed along the EXCYT beam lines; 2) the computer control; 3) the beam diagnostics. In July 2006 the first radioactive ion beam (^8Li) was delivered to experimental apparatus.

• *Other activities*

My knowledge and skills acquired in the field of low-level current measurements allowed me to contributing to some of the research projects financed by INFN Group V. Among these I would like to mention in chronological order: MINIT, CASCADE, SURADDA, LASCAR, NASTRI and DISCOLI.

Thanks to these skills, in December 2008 I had the pleasure to be invited by Dr. Tianjue Zhang, head of BRIF Technology Division of the China Institute of Atomic Energy in Beijing, to hold a seminar, at their headquarters, on "Low-level dc current measurements and their applications in beam diagnostic at INFN-LNS".

SCIENTIFIC PUBLICATIONS

- year 2016 **“Design of a large acceptance, high efficiency energy selection system for the ELIMAIA beam-line”**, F.Schillaci, M.Maggiore, L.Andó, G.A.P.Cirrone, G.Cuttone, F.Romano, V.Scuderi, L.Allegra, **A.Amato**, G.Gallo, G.Korn, R.Leanza, D.Margarone, G.Milluzzo, and G.Petringa - IOP Science, Journal of Instrumentation, 11(08):P08022-P08022, August 2016
- year 2016 **“The ELIMED transport and dosimetry beamline for laser-driven ion beams”**, F.Romano, F.Schillaci, G.A.P.Cirrone, G.Cuttone, V.Scuderi, L.Allegra, **A.Amato**, A.Amico, G.Candiano, G.DeLuca, G.Gallo, S.Giordanengo, L.Fanola Guarachi, G.Korn, G.Larosa, R.Leanza, R.Manna, V.Marchese, F.Marchetto, D.Margarone, G.Milluzzo, G.Petringa, J.Pipek, S.Pulvirenti, D. Rizzo, R.Sacchi, S.Salamone, M.Sedita, A.Vignati - Nuclear Instruments and Methods in Physics Research A 829 (2016) 153–158
- year 2015 **“Design of the ELIMAIA ion collection system”**, F.Schillaci, G.A.P.Cirrone, G.Cuttone, M.Maggiore, L.Andó, **A.Amato**, M.Costa, G.Gallo, G.Korn, G.Larosa, R.Leanza, R.Manna, D.Margarone, G.Milluzzo, S.Pulvirenti, F.Romano, S.Salamone, M.Sedita, V.Scuderi, and A. Tramontana - IOP Science, Journal of Instrumentation 10(12):T12001-T12001 · December 2015
- year 2015 **“Transport and dosimetric solutions for the ELIMED laser-driven beam line”**, G.A.P.Cirrone, F.Romano, V.Scuderi, **A.Amato**, G.Candiano, G.Cuttone, D. Giove, G.Korn, J.Krasa, R.Leanza, R.Manna, M.Maggiore, V.Marchese, D. Margarone, G.Milluzzo, G.Petringa, M.G.Sabini, F.Schillaci, A.Tramontana, L.Valastro, A.Velyhan - Nuclear Instruments & Methods in Physics Research A, 796 (2015) 99-103.
- year 2015 **“Design and Status of the ELIMED Beam Line for Laser-Driven Ion Beams”**, G.A.P.Cirrone, G.Cuttone, F.Romano, F.Schillaci, V.Scuderi, **A.Amato**, G.Candiano, M.Costa, G.Gallo, G.Larosa, G.Korn, R.Leanza, R.Manna, M.Maggiore, V.Marchese, D.Margarone, G.Milluzzo, G.Petringa and A.Tramontana - Applied Sciences 2015, 5, 427-445
- year 2014 **“Calibration and energy resolution study of a high dispersive power Thomson Parabola Spectrometer with monochromatic proton beams”**, F.Schillaci, M.Maggiore, A.Velyhan, G.A.P.Cirrone, G.Cuttone, D.Margarone, G.Parasiliti Palumbo, P.Pisciotta, D.Rifuggiato, F.Romano, G.Russo, V.Scuderi, C.Stancampiano, A.Tramontana, **A.Amato**, G.F.Caruso and S.Salamone – IOP Science, Journal of Instrumentation, Volume 9, October 2014
- year 2012 **“A very sensitive ion collection device for plasma-laser characterization”**, S.Cavallaro, L.Torresi, M.Cutroneo, **A.Amato**, F.Sarta, and L.Wen - Review of Scientific Instruments 83, 063305 (2012); doi: 10.1063/1.4730594
- year 2008 **“Nanostructured microsize YBCO mesas for applications as field sensors”**, E.Mezzetti, A.Chiodoni, R.Gerbardo, G.Ghigo, L.Gozzelino, F.Laviano, B.Minetti, **A.Amato**, A.Rovelli, R.Cherubini - Physica C: Superconductivity and its applications, Volume: 468, Issue: 7-10, April 1, 2008, pp. 817-819.
- year 2007 **“EXCYT: The RIB project at INFN-LNS”**, G.Cuttone, L.Celona, F.Chines, G.Cosentino, E.Messina, M.Re, D.Rizzo, V.Scuderi, F.Tudisco, **A.Amato**, L.Calabretta, G.De Luca, A.Pappalardo, S.Passarello, D.Rifuggiato, A.Rovelli - Nuclear Instruments and Methods in Physics Research B 261 (2007) 1040–1043.
- year 2005 **“Performances under ion irradiation of weak pinning superconductors MgB2 and Bi2Sr2Ca2Cu3Ox”**, D.Botta, A.Chiodoni, R.Gerbardo, G.Ghigo, L.Gozzelino, F.Laviano, A.Rovelli, **A.Amato** - Physica Status Solidi (c) 2, No. 5, (2005) 1638-1643.

- year 2005 **“A new apparatus for deep patterning of beam sensitive targets by means of high-energy ion beam”**, A.Rovelli, **A.Amato**, D.Botta, A.Chiodoni, R.Gerbardo, G.Ghigo, L.Gozzelino, F.Laviano, B.Minetti, E.Mezzetti - Nuclear Instruments and Methods in Physics Research B 240 (2005) 842-849.
- year 2003 **“An irradiation facility for in-vacuum heavy-ion irradiation of large area superconductors”**, A.Rovelli, **A.Amato**, D.Botta, A.Chiodoni, R.Gerbardo, G.Ghigo, L.Gozzelino, F.Laviano, M.Negro, E.Mezzetti, L.Martini, F.Curcio - International Journal of Modern Physics B, Vol. 17, Nos. 4, 5 & 6 (2003) 727-733.
- year 2003 **“Pseudo-Periodic Nanostructuring of Ag-Clad BSCCO-2223 Multifilamentary Tapes as a Tool to Tune In-Filed Superconducting Performance”**, R.Gerbardo, D.Botta, A.Chiodoni, G.Ghigo, L.Gozzelino, F.Laviano, B.Minetti, E.Mezzetti, A.Rovelli, **A.Amato**, L.Martini, F.Curcio - IEEE Transactions on Applied Superconductivity, Vol. 13, NO. 2, June 2003, 3000-3003.
- year 2001 **“Use of 62 MeV proton beam for medical applications at INFN-LNS: CATANA Project”**, G.Cuttone, **A.Amato**, A.Bartolotta, M.Brai, G.A.P.Cirrone, A.Giammò, S.Lo Nigro, G.A.Nicoletti, J.Ott, G.Privitera, L.Raffaele, R.L.Rallo, C.Rapicavoli, A.Reibaldi, D.Rifuggiato, N.Romeo, A.Rovelli, M.G.Sabini, V.Salamone, G.Teri, F.Tudisco - Physica Medica, Vol. XVII, Suppl. 3 (2001) 23-25.
- year 1998 **“Scintillating Detectors for Low Intensity Ion Beam Monitoring”**, P.Finocchiaro, **A.Amato**, G.Ciavola, G.Cuttone, M.Gu, G.Raia, A.Rovelli - IEEE Transactions on Nuclear Science, Vol. 45, NO. 3, June 1998.
- year 1998 **“Low intensity ion beam profiling with glass scintillating fibres”**, P.Finocchiaro, **A.Amato**, G.Ciavola, L.Cosentino, G.Cuttone, M.Gu, G.Raia, A.Rovelli - Nuclear Instruments & Methods A 419 (1998) 83-90.
- year 1997 **“A scintillating fibre-based profiler for low intensity ion beams”**, P.Finocchiaro, **A.Amato**, G.Ciavola, G.Cuttone, M.Gu, G.Raia, A.Rovelli - Nuclear Instruments & Methods A 385 (1997) 31-36.
- year 1996 **“The LNS computer control system for the commissioning of the superconducting cyclotron”**, A.Rovelli, G.Cuttone, D.Giove, **A.Amato**, S.Cavallaro, S.Pulvirenti - Nuclear Instruments & Methods A 382 (1996) 147-152.
- year 1994 **“Operational Experience with the Control System of the LNS Superconducting Cyclotron”**, G.Cuttone, A.Rovelli, **A.Amato**, S.Pulvirenti, D.Giove - IEEE Transactions on Nuclear Science, Vol. 41, NO.1, February 1994.

Short Curriculum Vitae

Luigi G. Celona

Dr. Celona received the degree in Electronic Engineering from the University of Catania, Italy in 1995 and he joined the Istituto Nazionale di Fisica Nucleare in 1996, at the Laboratori Nazionali del Sud in Catania (INFN-LNS), becoming Technological Research Physicist in 1998 and Principal Technological Research Physicist in 2006. His main field of activity concerns all over the different aspects regarding the production of singly and highly charged beams together with their acceleration. In particular, he proposed different innovative concepts for the development of ECR (electron cyclotron resonance) ion sources, actively working on the construction and development of many different ECR and microwave ion sources. This activity has taken to the development of the so-called "3rd generation ECRIS". In this field Dr. Celona has carried out various experiments at the major facilities worldwide (LBNL, GSI, MPI, MSU, etc).

He has also designed and built other types of ion and plasma sources, as the microwave discharge ion sources for high efficiency ionization of recoils (MIDAS) and for intense monocharged beam production and laser ion sources (PS-ESS, VIS and TRIPS). He also worked on the development of the K-800 Superconducting Cyclotron bunching system and on the design and construction of the EXCYT radioactive beam facility at INFN-LNS.

Record of accomplishment

- **Member of INFN Machine Advisory Committee;**
- **AISHa project team leader (PO FESR Sicily) since 01/2013;**
- **Leader of the Work Unit regarding the high intensity ESS proton source and its LEBT since 01/2011;**
- **Leader of the work package regarding the design of new components of accelerators for hadrotherapy (WP8) inside the RDH experiment supported by the 5th Scientific Committee of INFN since 01/2013;**
- **Technological and scientific coordination of the EXCYT facility since 01/2012;**
- **Member of the SPES referee committee since 01/2010;**
- **Member of the EMILIE referee committee since 01/2012;**
- **Chairman of the International Workshop on ECR Ion Sources (to be held in Catania on September 2018);**
- **Co-chairman of the International Conference on Ion Sources and member of the Scientific Advisory Committee (2009-2011);**
- **Leader of the UTOPIA experiment (electromagnetic wave interaction with plasma and generation of plasma waves in compact size machines) supported by the 5th Scientific Committee of INFN (2012);**
- **Coordinator of the HELIOS experiment (generation of hot electron layers in high density plasmas of ECR Ion Sources under different values of power and frequencies of the pumping electromagnetic wave) for INFN-LNS (2009-2011);**
- **Coordinator of the INES experiment (innovative methods of electromagnetic waves coupling to plasmas of ECR Ion Sources) for INFN-LNS (2005-2008);**
- **Technical coordinator for the final assembling, the commissioning and the first experiments of the EXCYT facility at INFN-LNS (2004-2007);**
- **Representative of the LNS Technological Research personnel for two terms from (09/2002 to 09/2008).**

Articles published in peer reviewed journals: >200