CURRICULUM VITAE

Personal Data

- Name — Alberto Pasquarelli
- Date of birth — Feb 14, 1958
- Place of birth — Rome, Italy
- Citizenship — Italian

Education

- 1971 - 1976 High School for electronics and nuclear energy applications
- July 1976 High School grade with note 60/60
- 1976 - 1984 Physics course at the University "La Sapienza", ROME (Italy); Study plan on Electronics and Cybernetics
- October 1984 Physics degree (Dottore in Fisica) with note 110/110

Professional Experience

1983 - 1984: Thesis on "Integration of Superconducting Magnetometers for Biomagnetism" carried on at Istituto di Elettronica dello Stato Solido (IESS) of the National Research Council (CNR) in Rome. The work consisted in the development of a technique for the simplification of the electro-mechanical structure of superconducting magnetometers and the related electronic system, with the goal to reduce size, costs, helium consumption and assembly time in multichannel systems.

1986 - 1989: Researcher at the "Physikalische Technische Bundesanstalt" in Berlin, Germany with the task of designing biomedical instrumentation. The main effort was dedicated in design and construction of:

- a 128-channel data acquisition system
- a 37-channel biomagnetic system for cardiology (with RF SQUID first and then upgraded to DC SQUIDs after I left PTB)
- a monitoring station with real time display of 64 channels out of 128
- an electronic matrix to configure 32 different potential differences having 32 EEG electrodes.

1989 - 1996: Researcher at CNR - IESS in Rome, having the task of promoting and coordinating the research lines carried out by the affiated operating units (institutes, departments, companies) working on Biomagnetism.
During this years the following systems were developped and built:

- 9-channel with second order gradiometers for neurology, in cooperation with Elettronica S.p.A.
- 11-channel with second order gradiometers for cardiology and gastroenterology in an unshielded environment, in cooperation with CITEC S.p.A. and the Institute for Medical Physics (IFM) of Chieti University.
- 28-channel with first order gradiometers for neurology, in cooperation with IBM and CITEC S.p.A.,
- Single-channel DC biosusceptometer at IFM, with instruments developped at IESS.
- Single-channel AC susceptometer for the study of iron overload in thalassemia and hemochromatosis.

Following systems where designed and partially prototyped:

- 55-channel flat system with magnetometers for cardiology, in cooperation with General Electric CRD center (Schenectady, N.Y., USA), ZIBMT-Ulm University (Ulm, Germany), and ATB (Chieti, Italy)
- 160-channel helmet system with magnetometers for neurology, in cooperation with General Electric CRD center (Schenectady, N.Y., USA) and ATB (Chieti, Italy).

1996 - 2004: Senior Researcher at the Ulm University in the "Zentralinstitut fuer Biomedizinische Technik" in Ulm, Germany, as responsible for the biomedical instrumentation.
During this time the main activity was targeted to set-up the "New Ulm Biomagnetic Center" featuring two Magnetografic systems:

- the first consisted in the final version of the flat 55 channels system from ATB (Argos 55) for clinical cardiology installed inside a 3+1 layers Shielded Room built in cooperation with Amuneal (Philadelphia, USA), which became operational in 1998.
- the second, a vectorial helmet system with 492 channels for clinical neurology, installed in the Neurology department of the hospital "Rehabilitationskrankenhaus Ulm", which became operational in 2004.

These systems were built making use of many different technologies, spanning from cryogenics and superconductivity to very low-noise read-out electronics, from Sigma-Delta A/DC arrays and Complex PLD's to real-time DSP processing and Gigabit networking, under the supervision of Graphical user interfaces for control and operation.

2005 to present: Senior Researcher at the Ulm University in the dep. “Electron Devices and Circuits” of the Engineering Faculty. Coordinator of projects in the field of technologies and devices for the active bio-/electrochemistry.

Teching and Tutoring

1991 Lecturer on “Biomagnetism” at "1st European Training on Technologies and Industrial Applications of Superconductivity (ETTIAS)" held in Naples from September 9 to 13.

1993 Instructor on “Analog and Digital Electronics” for the personnel of the company MQS.

1993 – 1994: Instructor on “Biomedical Instrumentation” for undergraduate students, at the University of Chieti.

1999 Lecturer on “Biomagnetism” at the "Quarto *Workshop* em Física Médica e Biofísica” held from February 8 to 10 at Sao Paulo University (USP), Ribeirao Preto, Brazil.

2008 to present: Lecturer for the course “Biosensors”, in Master Program “Advanced Materials” and Masterstudiengang “Elektrotechnik”

2010 to present: Lecturer for the course “Semiconductor Sensors”, in Master Program “Advanced Materials” and Masterstudiengang “Elektrotechnik”

Cooperations

1986 - 90: Elettronica S.p.A., Rome. Construction of the 9-channel system in conjunction with a data-acquisition system derived from the one developed at the PTB.

1989 - 90: IBM, Yorktown, N.Y., U.S.A.. Furnishing of five readout electronic systems for DC SQUID. This is the desktop, standalone version of the system developed for the 28-channel magnetometer.

1989 - 92: CITEC S.p.A., Rome. Design and contruction of the readout and data acquisition systems for the 28-channel magnetometer installed at I.E.S.S, and for the 11-channel magnetometer installed at IFM.

1992 - 1993: MQS S.R.L., Chieti. Development of cryogenic devices (dewar and SQUIDS) and electronic chain, for the "class 100" systems

1992 - 1998: General Electric CRD, Schenectady, N.Y., U.S.A.. Development of the Biomagnetic Sensor System Controller (BSSC) for the "class 100" systems

1989 – 1992: Chieti University, Istituto di Fisica Medica (IFM). Biomagnetic research lines on both techological and experimental aspects unshielded environments. Relevant studies on cardiology, gastroenterology and biosusceptometry were carried out with single- and multi-channel systems

1991 - 1994: Goteborg University, Sweden, Department of Applied Electronics. Development of measurement techniques for biomagnetic investigations on Parkinsonian patients

1992 - 2004: Chieti University, Istituto per le Tecnologie Avanzate Biomedicali (ITAB). Development of the new biomagnetic and bioelectric systems for Neurology and Cardiology to be installed at ITAB, in cooperation with GE, MQS and later with ATB.

1992 - 1995: Ulm University, Zentralinstitut fuer Biomedizinische Technik (ZIBMT). Development of new technologies for data acquisition and analysis in biomagnetism. Development of high performance AC susceptometers for magnetic imaging.

1995: Universitaetsklinikum Eppendorf (UKE). Biochemie Abteilung, Susceptometric study of biological samples and development of a "third generation" bioferritometer for clinical applications.

1995 - 2004: Advanced Technologies Biomagnetics (ATB), Chieti. Development of cryogenic devices (dewar and SQUIDS) and electronic chain, for the "class 100" systems

1994 – 1998: Amuneal, Philadelphia (USA). Development and construction of magnetically shielded rooms (MSR) for Biomgnetism.

1997-1998: Technische Universität Ilmenau. Study of additional active shielding for magnetically shielded rooms.

1999 to present: Departamento de Física e Matemática-FFCLRP, Universidade de São Paulo Ribeirao Preto (Brazil). Development of cryogenic instrumentation for biomagnetism

2000 – 2001: Robert Bosch GmbH. Developmet of the biomedical instrumentation for a driving simulator, to study the responsiveness of drivers under stress conditions.

2003 – 2004: Institute of Atomic Physics, University of Fribourg (Switzerland). Study of optical magnetometer systems for clinical use.
2005 to present: University of Torino (Italy), Department of Neurosciences. Development of planar diamond chips to study the elelectrophysiology of secretory cells.

2006 to present: Rho-BeSt Coating GmbH, Innsbruck (Austria). Growth and surface functionalization of diamond thin-films and coatings for biological and medical applications.

2007 to present: Bruno Kesseler Foundation, Trento (Italy). Material analysis and functionalization of Diamond thin films.

2007 to present: Institute of Physics of University of Sao Paulo, Department of Applied Physics, Sao Paulo (Brazil). Growth and surface functionalization of diamond thin-film, to be used as support material for dental implants and dental tissue regeneration.

2008 to present: University Clinic Jena, Clinic for Neurology, Group of optical Magnetometry. Development of high-performance electronics for multichannel optical magnetometers.

Funded Projects

2004: Principal investigator in project Nr. 13055 “Design development and production of measurement systems for Biomagnetism”, supported by ATB Srl, Chieti, Italy. Total funding: 23.200 Euro.

2008 - 2010: Project leader of P5113008 “Entwicklung einer Steuerelektronik für optische Magnetometer inklusive Vorverstärker” supported by Uniklinikum Jena. Total funding: 90.000 Euro.

2008 – 2011: Project leader of P5113013 “ Ampero/potentiometrische Biochips für die nicht-invasive Messung von Liganden-gesteuerten Calcium-permeablen Ionenkanälen in dendritischen Zellen”, supported by Landestiftung Baden-Württemberg (now Baden-Württemberg Stiftung). Total funding: 274.200 Euro.

2011 – 2013: Principal investigator in project P5113034 „Entwicklung eines neuartigen elektrochemischen Detektorsystems mit Diamantelektroden zur Erhöhung der Empfindlichkeit und Messgenauigkeit in der Aminoglykosid-Antibiotika Analytik; Entwicklung Bor-dotierte Diamantelektroden zur elektrochemischen Analyse von Aminoglykosid-Antibiotika“ supported by the ZIM programme of the Federal Ministry of Economics and Technology (BMWi – AIF). Total funding 154.575 Euro.

References

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2) Carelli P., Del Gratta C., Foglietti V., Modena I., Pasquarelli A., Pizzella V., Pullano M., Romani G.L. and Torrioli G.: A nine channel DC SQUID system for Biomagnetism; In Advances in Biomagnetism 665-668 (Proc. of the 7th Int. Conf. on Biomagnetism) Ed. S.J.Williamson et al Plenum Press, New York (1989).

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4) Basile M., Neri M., Carriero A., Casciardi S., Comani S., Del Gratta C., Di Donato L., Di Luzio S., Macri' M.A., Pasquarelli A., Pizzella V. and Romani G.L.: Measurement of Segmental Transit Through the Gut in Man: a Novel Approach by the Biomagnetic Method; Digestive Diseases and Sciences, Vol.37 No 10, 1537-1543;1992.

5) Basile M., Neri M., Carriero A., Casciardi S., Comani S., Del Gratta C., Di Donato L., Di Luzio S., Macri' M.A., Pasquarelli A., Pizzella V. and Romani G.L.: A novel method for measuring segmental transit time through the gut using a biomagnetic instrumentation; Gastroenterology Vol. 100 No 5, Part 2.

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