

**Preliminary Programme – Rome Monday December the 9<sup>th</sup> 2019**  
**Rehabilitation: a future challenge of Robotics**

**Location:**

IRCCS San Raffaele Roma -Via di Val Cannuta, 247, Rome-Italy

**9.00 Welcome address**

Greetings from the authorities:

**9.30 I session**

**Chairs: Paolo Maria Rossini and Marco Franceschini**

- 9.30 Introduction  
Marco Franceschini
- 9.40 Brain plasticity: from synapses to connections  
Paolo Maria Rossini
- 10.00 Biology of functional recovery: the role of robotics  
Franco Molteni
- 10.20 Robotic interventions for acute and chronic rehabilitation of gait  
Alberto Esquenazi
- 10.45 End-effector and exoskeleton robots in neurological rehabilitation  
Michela Goffredo
- 11.00 Discussion

**11.10 Break**

**11.30 II session**

**Chairs: Pietro Fiore and Francesca Gimigliano**

- 11.30 Robotics and research in Italy  
Maria Chiara Carrozza
- 11.50 Upper limb robotic assisted rehabilitation after stroke: review of the evidence  
Thierry Lejeune
- 12.10 Tailoring robotic treatment and assessment  
Federico Posteraro
- 12.30 Robot Assisted Training for the upper limb after stroke and biomarkers to predict outcome  
Hermano Igo Krebs
- 12.50 Discussion

**13.00 Break**

**14.00 III session - Lecture**

**Chair: Francesca Gimigliano**

- 14.00 ISPRM & Robotics: opinions and future challenges  
Walter Frontera

**14.30 IV Session - Italian experiences on Robotics**

**Chairs: Luca Padua and Dino Bramanti**

- 14.30 Upper limb robotic rehabilitation in subacute stroke patients. A multicenter study of Fondazione Don Carlo Gnocchi  
Irene Aprile (Rome)
- 14.40 Italian rehabilitation multicenter studies: a critical view  
Donatella Bonaiuti (Monza)
- 14.50 Dino Bramanti (Messina)
- 15.00 Giorgio Felzani (Sulmona)
- 15.10 Alessandro Giustini (Porto Potenza Picena)
- 15.20 Stefano Mazzoleni (Pisa)
- 15.30 Silvia Sterzi (Rome)

15.40 Discussion and conclusions  
Alberto Esquenazi and Franco Molteni

**16.10 Roundtable - Which innovative technologies are the future?**

**Moderators: Fabrizio Tagliavini and Valter Santilli**

Francesca De Pandis (Cassino), Sandro Iannacone (Milan), Francesco Infarinato (Rome), Thierry Lejeune (Brussels), Domenica Le Pera (Rome), Sanaz Pournajaf (Rome), Fabrizio Vecchio (Rome).

17.20 Discussion and conclusions  
Walter Frontera and Federico Posteraro

**18.00 Closure of the Congress**

Official Language: English  
(simultaneous translation in Italian language)

**President of the Congress: Marco Franceschini**

**Keynote speakers (in alphabetical order):**



**Maria Chiara Carrozza, Eng, PhD**

*IRCCS Fondazione Don Carlo Gnocchi, Milan (Italy)*

Maria Chiara Carrozza is Professor of Industrial Bioengineering at The Biorobotics Institute of Scuola Superiore Sant'Anna, Pisa, Italy, where she served as Rector from 2007 to 2013. Since January 2018, she is Scientific Director of Fondazione Don Carlo Gnocchi an Italian network of Research Hospitals dedicated to Rehabilitation and Personal Assistance. She currently serves as President of the National Group of Bioengineering. She has teaching

and research experience in several Institutions in Italy, Europe, USA, Japan, Korea, China. She is also a member of the Robotics and Automation Society (IEEE-RAS) and of the Engineering in Medicine and Biology (IEEE-EMBC). Maria Chiara Carrozza was principal investigator and coordinator of several international research projects, funded by the European Union. From 2016 to 2017 she was Chair of the Interim Evaluation of the Future Emerging Technology Flagship Program and Member of the Steering Committee of the Quantum Technology Flagship for the European Commission. She also holds several patents and is involved in activities of technology transfer in research and innovation projects. She is Founding Partner of IUVO srl, a start-up active in Wearable Robotics. Since 2015 she is Independent Director of Piaggio SpA. She has been a Member of the Chamber of Deputies (Camera dei Deputati) of the Italian Parliament from 2013 to 2017 serving in the Committee of Foreign and European Affairs. She was Minister of Education, University and Research from April 28, 2013 to February 22, 2014



**Alberto Esquenazi, MD**

*Moss Rehabilitation Hospital – Philadelphia (USA)*

Dr. Esquenazi, serves as the John Otto Haas Chair of the Department of PM&R, and Director of the MossRehab Gait and Motion Analysis Laboratory, and the Regional Amputee Center in Philadelphia. Dr. Esquenazi is Professor of PM&R at Jefferson and Temple Universities Departments of PMR and of Biomedical Engineering at Drexel University.

Dr. Esquenazi's research focuses on gait analysis, prosthetics, orthotics, spasticity and robotics in rehabilitation. Dr. Esquenazi has published widely in peer-reviewed journals his research work and has authored more than 40 book chapters.

He is a past member of the board of the ISPRM and Past President of the American Academy of Physical Medicine and Rehabilitation. He is the recipient of prestigious national and international awards for his clinical, research and educational efforts including teKrusen Lifetime Achievement Award from AAPMR and is honorary member of the Italian Society of Physical and Rehabilitation Medicine (SIMFER).

	<p><b>Marco Franceschini, MD</b>  <i>IRCCS San Raffaele Pisana, Rome (Italy)</i>  Clinical Neuro-Rehabilitation Research Director in IRCCS San Raffaele, Pisana – Rome and Full Professor of Physical Medicine and Rehabilitation (PM&amp;R) in San Raffaele University of Rome. Professor Franceschini served as Chair of the Geriatric and PM&amp;R Department at University Hospital of Parma and PM&amp;R Department at the University Hospital of Modena and Health Local Area of Modena. He is a member of the Italian Society of PM&amp;R, Chairmen of Research Committee of International Society of PM&amp;R. Honorary Member of Italian Society of Neuro-Rehabilitation. Associate Editor of European Journal of Physical Medicine and Rehabilitation.</p>
	<p><b>Walter Frontera, MD, PhD</b>  <i>University of Puerto Rico – ISPRM President</i>  Professor Frontera served as Founding Chair of the Departments of PM&amp;R at Harvard Medical School and Vanderbilt University and Dean of the Faculty of Medicine at the UPR. He is a member of the US National Academy of Medicine, Fellow of the Royal College of Physicians (London), and Past-President of the International Federation of Sports Medicine. He has received the US Association of Academic Physiatrists' Distinguished Academician and Outstanding Service Awards, the Sydney Licht Award of the ISPRM, the Rusk Award for Leadership and Innovation in PM&amp;R, and the Kessler's Foundation's Joel De Lisa, MD Award. He is a Corresponding Member of the Italian Society of Physical and Rehabilitation Medicine. Editor-in-Chief of American Journal of Physical Medicine and Rehabilitation. President of International Society of Physical and Rehabilitation Medicine.</p>
	<p><b>Michela Goffredo, Eng, PhD</b>  <i>IRCCS San Raffaele Pisana, Rome (Italy)</i>  Michela Goffredo serves as a Biomedical Engineer and researcher in rehabilitation robotics at IRCCS San Raffaele Pisana Rome. She received the degree in Electronic Engineering and the PhD in Biomedical Electronics from the University Roma TRE. She worked as senior research assistant at the School of Electronics and Computer Science of the University of Southampton (UK). Her research activity focuses on human motion analysis, robotics in rehabilitation, virtual reality, and gait analysis. She is currently involved in a multicentric study entitled "Exoskeleton-based gait rehabilitation of stroke patients: clinical and neuromuscular assessment", and in a clinical study on the efficacy of a virtual reality system for the rehabilitation of orthopaedic patients.</p>
	<p><b>Hermano Igo Krebs, PhD</b>  IEEE Fellow, Principal Research Scientist &amp; Lecturer. MIT, Mechanical Engineering Dept The 77 Lab (USA).  Adjunct Professor at University of Maryland, School of Medicine, Dept Neurology, Visiting Professor at Osaka University, Mechanical Science and Bioengineering Dept, Fujita Health University, School of Medicine Newcastle University, Institute of Neuroscience Loughborough University, The Wolfson School of Engineering Member Scientific PhD Board University Campus Bio-Medico of Rome, Programme Bioengineering &amp; Biosciences.  Member Scientific Board of Advisors - Healthcare Engineering Innovation Center (HEIC) and Khalifa University of Science and Technology (Abu Dhabi, UAE)</p>



**Thierry Lejeune, MD**

*Université catholique de Louvain, Brussels (Belgium)*

Full Professor at Leuven University – Brussels

Médecine Physique et Réadaptation

Cliniques universitaires Saint-Luc

Thierry Lejeune, MD PhD, is a specialist in Physical and Rehabilitation Medicine. He is the head of his department at the Cliniques universitaires Saint-Luc, and full professor at Université Catholique de Louvain. He's leading research on new technologies in neurorehabilitation and movement analysis at the Institute of Experimental and Clinical Research.



**Franco Molteni, MD**

*Villa Beretta Rehabilitation Center, Valduce Hospital, Costa Masnaga (Italy)*

MD, University of Milan. Specialization on Physical Medicine and Rehabilitation in 1984. 1985 awarded of the National Price of the Italian Society of Physical Medicine and Rehabilitation. Director of the Department of Rehabilitation Medicine and Gait and Motion Analysis Lab at Valduce Hospital Villa Beretta Rehabilitation Center in Costa Masnaga, Italy (2004 to present). Scientific Director of Fondazione Valduce (2004 to present). Consultant in Physical Medicine and Rehabilitation at the Neurological Institute "Carlo Besta", Milan, Italy (2004 to present). Director of Scientific Cooperation Valduce Hospital - Thumbay Physical Therapy & Rehabilitation Hospital / Gulf Medical University Ajman UAE. Member Scientific Advisory Committee Fondazione Don Gnocchi Italy. Research Associate STIIMA Institute Milan National Council of Research. Member Scientific Advisory Board Movendo Technology Italy, Merz Pharma Germany, Ekso Bionics USA.



**Federico Posteraro, MD**

*Rehabilitation Department Versilia Hospital AUSL Tuscany North West, Camaiore (Italy)*

Federico Posteraro received the M.D. degree with first class honors from the University of Naples (Italy) in 1987. He completed residencies in child neurology and psychiatry, and in physical medicine and rehabilitation, both with first class honors, at the University of Pisa Medical School, Pisa, Italy, in 1987 and 1993, respectively. From 1989 to 1992, he was a Medical Doctor in the Rehabilitation Centre for Adolescents, Stella Maris Scientific Institute, Pisa where he was a Researcher from September 1993 to July 2002. In July 2002, he joined Versilia Hospital, Camaiore (Lucca), Italy. Versilia Hospital as a Medical Doctor in the Rehabilitation Department. In August 2008, he became the Director of the Neurological Rehabilitation and Brain Injury Rehabilitation Department, Auxilium Vitae Rehabilitation Centre, Volterra (Pisa), Auxilium Vitae Rehabilitation Centre. Since December 2011, he has been the Head of the Rehabilitation Department, Versilia Hospital – USL north-west Tuscany. From 1996 to 2013, he taught at the School for Physiotherapists, University of Pisa, Pisa, Italy, and from 2010 to 2013 at the School for Occupational Therapists, University of Pisa. He has been responsible for the Stella Maris Scientific Institute TREMOR Project in Telematics Application Programme Project DE 3216 and of H-FORM Project in Horizon Programme Project 0534/E2/H/M. He is the author or co-author of more than 51 ISI/Scopus papers.





**Paolo Maria Rossini, MD**

*IRCCS Fondazione Policlinico Universitario A. Gemelli, Rome (Italy)*

1995-2003 Editor-in-Chief of “Electroencephalography and Clinical Neurophysiology”; Full Professor Neurology, Faculty of Medicine, Director Area of Neuroscience, A. Gemelli Foundation, Rome; 2010-2014 President of the International Federation Clinical Neurophysiology (IFCN); Reviewer EU projects (including FET & ERC); 2014-2016 Chairman EU Joint Programming Initiative (JPI) on Demographic Changes (MYBL); Reviewer for Brain, Neuron, Neurology, Annals of Neurology, Current Biology, Cortex, Journal of Neuroscience, Neuroscience, Eur.J.Neuroscience, Neurosci.Lett., Exp. Neurology, Brain Res., NeuroImage, Human Brain Mapping, Muscle & Nerve, Clinical Neurophysiology, Science Transl.Med., Stroke, Neurobiology of Aging, Neurorehab .& Neurorepair, Biol. Psych., PlosONE etc.; Reviewer for Governments/research agencies/councils: Israel, Germany, Finland, Austria, Ireland, France, The Netherlands, Russia, Singapore, Hong Kong, Saudi Arabia, Spain and Italy, Wellcome Trust, Telethon, Weston Brain Institute, Vici, Fondation Amidex.; 670 full-text manuscripts in Pub Med with >3.800 points of I.F. and >49.000 citations; ISI W.o.K. h-index of 88 (86 Scopus, 106 Google Scholar).

**Participants (in alphabetical order):**

Aprile Irene, Rome  
Bonaiuti Donatella, Monza  
Bramanti Dino, Messina  
Felzani Giorgio, Sulmona  
Fiore Piero, Bari, SIMFER President  
Franceschini Marco, Rome  
Gimigliano Francesca, Naples  
Giustini Alessandro, Porto Potenza Picena  
Iannacone Sandro, Milan  
Infarinato Francesco, Rome  
Le Pera Domenica, Rome  
Mazzoleni Stefano, Pisa  
Padua Luca, Rome  
Pournajaf Sanaz, Rome  
Rossini Paolo Maria, Rome  
Santilli Valter, Rome  
Sterzi Silvia, Rome  
Tagliavini Fabrizio, Milan  
Vecchio Fabrizio, Rome

**Scientific committee (in alphabetical order):**

Goffredo Michela  
Pournajaf Sanaz  
Van Rijn Astrid

**Organizing committee(in alphabetical order)**

Pellicciari Leonardo

**Endorsement**

Società Italiana di Medicina Fisica e Riabilitativa (SIMFER)  
International Society of Physical Rehabilitation & Medicine (ISPRM)