

NCM 2016: Special Symposium

The Neuroscience of Extraordinary Motor Skill: Sensory-Motor, Cognitive, and Pathologic Attributes of Artistic Performance

Biosketches:

Performing Artists--

Kenneth Broadway (Music: piano) has enjoyed a career that has taken him throughout the world as soloist and collaborative artist. He is most recognized for his work with pianist Ralph Markham as part of one of the world's most accomplished piano duos. Markham and Broadway performed at such prestigious venues as the Vienna Konzerthaus, the Berlin Komische Opera, Wigmore Hall in London, the Théâtre des Champs-Élysées in Paris, and Avery Fisher Hall at Lincoln Center. They also performed with major orchestras such as the Royal Philharmonic, the Vienna and Los Angeles Chamber Orchestras, and the Vancouver, Atlanta and San Francisco Symphony Orchestras. As a chamber musician he has appeared internationally with many leading instrumentalists and singers. His recordings have appeared on the Virgin Classics, Telarc, and RCA Red Seal Labels. Early musical studies began in Cleveland, Ohio. From there he went on to Michigan where he graduated from the Interlochen Arts Academy with highest academic and artistic honors. Further studies with prestigious teachers took place at the Cleveland Institute of Music, and later in Paris and Munich. In recent years Ken has given hundreds of recitals for Concerts in Care, an organization which brings performers to health care centres around British Columbia. Music education has been, and continues to be, an important passion. He has served as Instructor of Collaborative Piano at the School of Music, University of British Columbia, and enjoys a highly regarded career in private piano instruction for a class of extremely gifted students at his studio in Vancouver.

Peter Sparling (Dance) is the Rudolf Arnheim Distinguished University Professor of Dance and an Arthur F. Thurnau Professor at University of Michigan. A graduate of Interlochen Arts Academy and The Juilliard School, Sparling was a member of the José Limón Dance Company (1971-73) and principal dancer with Martha Graham Dance Company (1973-87). As Graham's assistant, he coached Rudolf Nureyev and collaborated with her on many new works. He has performed and staged Graham's works all over the world and has appeared on PBS *Dance in America*. His new work for the Martha Graham Dance Company, *Notes for a Voyage*, was premiered in New York City in the fall 2014.

Sparling has had extensive experience as artistic director, (Peter Sparling Dance Company 1979-1983 NYC, 1993-2007 Ann Arbor), choreographer, performer, teacher (U-M Distinguished Faculty Award and 1998 Governor's Michigan Artist Award), lecturer, video artist, writer (*Ballet Review*, *Choreographic Practices*, *Michigan Quarterly Review*), collaborator, administrator (former chair, U-M Dance Department) and dance/arts consultant. His dances for video have been selected for numerous international festivals, including the 2007 New York Dance on Camera Festival, the 2008 American Dance Festival Dance Film & Video Festival, Lisbon's InShadow Festival 2010 and DANCE:FILMS Glasgow. His made-for-TV work, *Climbing Sainte-Victoire*, was broadcast on Michigan Television in 2009. Sparling was a resident at Cité Internationale des Arts in Paris in 2010. He collaborated with Ernestine Ruben, photographer, to produce video murals for

Photoformance at UM Museum of Art in 2011 and *Water Alchemy* for the Dalet Gallery in Philadelphia. He has presented papers at Society of Dance History Scholars and European Association for Dance History; he recently co-chaired the groundbreaking conference, *Meanings and Makings of Queer Dance*, at UM. His video montages, *Beautiful Captives: Martha Graham and the Cinematic Id*, and *Variations of Angels* were screened during performances of the Martha Graham Dance Company's 2012-13 seasons. He recently presented *S is for Screendance*, a showing of four dance works for video including the premiere of *Last Man at Willow Run*, shot at the abandoned Willow Run Bomber Plant in Ypsilanti, MI. in May 2014 His screendance, *The Snowy Owl*, was featured in the Short Film Corner of the Cannes Film Festival 2015. He was a resident artist during 2014-15 at UM North Campus Research Complex, where he created video works for his multi-screen installation, the PUPP, or Pop-Up Projection Pavilion. Sparling continues his 9-year residency at the Life Sciences Institute, where he has collaborated with cell biologist Dan Klionsky.

Neuroscientists - Session Leaders

Eckart Altenmüller (Keynote speaker) is a full university professor and medical doctor, and has an active research and concert career. He graduated in Medicine and in Music at the University of Freiburg, where he obtained his concert diploma in the master classes of Aurèle Nicollet and William Bennett. His clinical training was in the Department of Neurology in Freiburg and Tübingen as a neurologist and neurophysiologist. In 1994, he became Chair and Director of the Institute of Music Physiology and Musicians' Medicine at Hannover University of Music and Drama, a position he has held for the past 22 years. In this role, he has continued his research into sensory-motor learning and movement disorders in musicians, into emotional processes while listening to music and into neurologic music therapy. He has published more than 200 scientific articles and has edited five books. Dr. Altenmüller is Member of the prestigious Göttingen Academy of Sciences since 2005, and Vice-President of the German Society for Music Physiology and Musician's Medicine. In 2013 he received the science award of the country of Lower Saxony. Since 2015 he is vice-president of the University of Music, Drama and Media, Hannover.

Lutz Jäncke (session leader) is full professor (Ordinarius) of Neuropsychology at the University of Zurich. He received several calls from different research labs and universities all over the world. His main research interest is brain plasticity, learning, and functional neuroanatomy. One special interest is how the human brain is shaped by experience. For this he often uses professional musicians as models for brain plasticity. His research bridges the gap between basic cognitive processes, real life applications in learning, rehabilitation, diagnostics and modern neurosciences. He has published more than 350 papers, several books, many book chapters and has appeared frequently in public media as a scientific consultant. His scientific work belongs to the 1% of most cited work world-wide in all research fields. He received several grants and awards, including the Heisenberg stipend-ship from the German Research Foundation. He is adjunct professor at several universities internationally, and is a member of the Dana foundation. He is also a passionate teacher, having earned several teaching awards that include the Credit Swiss Teaching Award for best teaching in 2007 (renewed in 2010) and the "Goldene Eule" from the ETH, Zurich.

Gottfried Schlaug (session leader) is a Professor of Neurology at Harvard Medical School and Co-Director of the Stroke-Center at BIDMC. He was Chief of the Division of Cerebrovascular Disorders and Stroke from 2005 to 2013, and is currently the Chief of the Division of Stroke Recovery and Neurorestoration, as well as the Director of the Music, Neuroimaging, and Stroke Recovery Laboratories at Beth Israel Deaconess Medical Center. He also serves as an Associate Editor of the *Annals of Neurology*. Training in Neurology was done both in Düsseldorf, Germany and in Boston, USA. He is a trained musician with a performance degree in organ and choir directing. His main research interests are centered on ways to induce and detect in-vivo brain plasticity in patients recovering from stroke and from developmental disorders, as well as in normal healthy subjects undergoing intense and long-time training of sensorimotor skills such as learning and playing a musical instrument. He is also studying the neural correlates of unique musical skills such as absolute pitch, and auditory-motor disorders that affect non-musicians as well as musicians, including the inability to sing in tune (Tone-deafness) or to move to a particular beat (Beat-deafness). More recently he has combined his interests in neuroscience related to music and his clinical work in stroke by developing innovative methods of auditory-motor training to enhance speech and motor functions in stroke patients and in children with developmental disorders such as minimally-verbal children with autism. Dr. Schlaug has published over 250 peer-reviewed manuscripts and more than 20 book chapters together with members of his lab and collaborators. His research work has been continuously supported over the last 15 years by grants from the NIH as well as grants from NSF, CIMIT, Autism Speaks, and private foundations.

Dagmar Sternad (session leader) received her BS in Movement Science and Linguistics from the Technical University of Munich and her PhD in Experimental Psychology from the University of Connecticut. From 1995 until 2008, she was Assistant, Associate, and Full Professor at the Pennsylvania State University in Kinesiology and Integrative Biosciences. From 2008 to the present day, she has held an interdisciplinary appointment as Professor in Biology, Electrical and Computer Engineering, and Physics at Northeastern University in Boston. Her research in computational neuroscience and motor control has been driven by her passion for dance and exercise. She participated in competitive gymnastics for 16 years at both school and university levels, before embracing dance during her university days in Munich. Combining gymnastics and dance lead to competitive swing dancing at the national level coupled with performances at venues throughout Germany. Her masters degree in exercise physiology was on the cardiovascular effects of aerobic dancing, research that propelled her into the 1980s whirlwind of aerobics. She hosted a regular radio program for 12 years and made several TV appearances on dance and aerobics. These activities resulted in the publication of 5 popular books and the decision to pursue her career in science.

Terry Sanger (session leader) holds an SM in Applied mathematics (Harvard), PhD in Electrical Engineering and Computer Science (MIT), and MD (Harvard), with medical specialization in Child Neurology and Movement Disorders. He is currently Associate Professor of Biomedical Engineering, Neurology, and Biokinesiology, and he is the director of the Pediatric Movement Disorders Clinic at Childrens Hospital of Los Angeles, and the Health Technology and Engineering program at USC (HTE@USC). His research on disorders of developmental motor control is driven by his interest in finding new treatments for children with movement disorders including dystonia, chorea, spasticity, and dyspraxia. He has a particular interest in computational motor learning,

and the role of motor learning in recovery from childhood brain injury. Major focus areas of laboratory research include wearable devices to promote motor learning, EMG-driven communication devices and assistive prosthetics, and modeling of the electrophysiology of deep-brain stimulation. Personal involvement in motor control and motor learning includes snowboarding, jazz and classical piano, bluegrass banjo, and ballroom dance with particular focus on Argentine Tango.

Gary D. Paige (Symposium Organizer) is Professor Emeritus of Neurology and Chair Emeritus of Neurobiology and Anatomy, University of Rochester. Dr. Paige graduated high school from the Interlochen Arts Academy, majoring in music, while also spawning a lifelong passion in photography. He received his undergraduate education (BS in Biology, 1970) at the University of California, Irvine, before attending the University of Chicago's MD-PhD program (completed, 1981). After internship (Anesthesiology) at Michael Reese Hospital in Chicago, he completed an Ophthalmology residency (1985) at the University of California, San Francisco. He then joined the Otolaryngology faculty at Washington (St. Louis), but in 1990 was recruited to the University of Rochester in Neurology, serving as Unit Chief of Sensory-Motor Neurology and Director of the Balance and Eye Movement Laboratory and clinic. From 1998 to 2014 he served as Chair of Neurobiology & Anatomy, and founded the Center for Navigation and Communication Sciences, the Schmitt Program on Integrative Brain Research, and the MD-MS Program in Medical Neurobiology. Research focuses on how the brain integrates and adapts sensory inputs from the outside world (visual and auditory) with the internal senses (vestibular and somatosensory) to guide meaningful behavior through a cluttered environment. A new endeavor is the Arts in Mind project, whose goal is to connect students of all stripes with the performing arts wherever poignant topics resonant and align with academic relevance.