SOCIETY FOR THE ADVANCEMENT OF BRAIN ANALYSIS
11th Annual Conference

&

BRAIN SCIENCE INTERNATIONAL

MAY 1-5, 2013

2013 Conference and Workshops
Charleston, SC

May 1-3 BSI Workshops
May 3-5 SABA Meeting

Charleston Marriott
170 Lockwood Drive
**SCHEDULE**

**WEDNESDAY, MAY 1**
8:30-5:30  
BSI PROFESSIONAL QEEG PROGRAM Day 1  
Jay Gunkelman, QEEGD

8:30-5:30  
BSI NEUROTHERAPY CERTIFICATION PROGRAM  
Day 1  
Cynthia Kerson, PhD

**THURSDAY MAY 2**
8:30-5:30  
BSI PROFESSIONAL QEEG PROGRAM Day 2  
Jay Gunkelman, QEEGD  
Joel Lubar, PhD

8:30-5:30  
BSI NEUROTHERAPY CERTIFICATION PROGRAM  
Day 2  
Barry Sterman, PhD

**FRIDAY, MAY 3**
8:30-5:30  
BSI PROFESSIONAL QEEG PROGRAM Day 3  
Joel Lubar, PhD

8:30-5:30  
BSI NEUROTHERAPY CERTIFICATION PROGRAM  
Day 3  
Cynthia Kerson, PhD

**SABA BEGINS**
12:30-1:30 LUNCH (included)

1:30-2:20  
APPLIED NEUROSCIENCE FOR THE ASSESSMENT AND TREATMENT OF COMBAT RELATED HEAD INJURY AND PTSD  
David Hagedorn, PhD

2:30-3:20  
HEART-BRAIN CONNECTIONS - PART 1  
Lynda Thompson, PhD

3:30-4:20  
SLOW CORTICAL POTENTIAL FEEDBACK FOR THE TREATMENT OF ADHD  
Sarah Wyckoff, PhDC

6:30-7:30  
EVIDENCE-BASED MEDICINE: NEUROTHERAPY & EPILEPSY  
Robert Turner, MD  
Barry Sterman, PhD

**SATURDAY, MAY 4**
8:00-9:00 BREAKFAST (included)

9:00-10:00  
THE ROLE OF SLEEP IN ADHD  
Jay Gunkelman, QEEGD

10:15-11:15  
EVIDENCE-BASED NEUROTHERAPY: STATUS & RECOMMENDATIONS  
Barry Sterman, PhD

11:30-12:30  
THE BAYESIAN BRAIN: AN OLD ‘NEW’ VIEW ON BRAIN FUNCTIONING AND ITS IMPLICATIONS FOR BRAIN ANALYSIS  
Dirk De Ridder, MD

12:30-2:00 LUNCH (included)

2:00-3:00  
LOW-RESOLUTION BRAIN ELECTROMAGNETIC TOMOGRAPHY (LORETA)  
Rex Cannon, PhD

3:15-4:15  
AUDITORY INTEGRATION TRAINING AS AN ADJUNCT TO NEUROTHERAPY  
Ali Hashemian, PhD

4:15-5:30  
LORETA DEBATE - CRITICISMS AND POTENTIAL  
Rex Cannon, PhD - Con Position  
Barry Sterman, PhD - Pro Position

**SUNDAY, MAY 5**
8:00-9:00 BREAKFAST (included)

9:00-10:00  
HEART - BRAIN CONNECTIONS - PART 2  
Lynda Thompson, PhD

10:15-12:15  
PANEL: IN SEARCH OF NEURONAL CIRCUITS FOR REWARD AND OPERANT CONDITIONING  
Gary Aston-Jones, PhD  
SELECTIVE MODULATION OF BRAIN AROUSAL SYSTEMS  
Bary Sterman, PhD  
BRAIN CIRCUITS ASSOCIATED WITH LEARNING: BASAL FOREBRAIN PATHWAYS

12:30 - 1:30  
LUNCH (included)

1:30-2:30  
NON-INVASIVE NEUROMODULATION (TMS, TDCS, TACS, TRNS, LORETA NEUROFEEDBACK): MERELY INVESTIGATIONAL OR TREATMENT TOOLS?  
Dirk De Ridder, MD
Dr. Gary Aston-Jones is the Murry Chair of Excellence in Neuroscience. His primary research interests are in the brain neuromodulatory systems, and their roles in cognitive performance, drug abuse, sleep and waking, and affective disorders. He uses a multidisciplinary approach, primarily involving single unit neurophysiology, neuroanatomy and behavioral neuropharmacology in rats and monkeys. He and his colleagues have recently described a role for the brain noradrenergic locus coeruleus system in decision processes, in the circadian regulation of sleep and waking, and in depression. Other of his lab's recent work also reveals a key role for the A1/A2 noradrenergic brain system innervation of the ventral forebrain in the affective response to drug withdrawal, and also indicates an important role of this and related systems in the drug seeking that accompanies protracted opiate withdrawal.

Dr. De Ridder is a neurosurgeon since 1999, specialized in brain stimulations for suppressing phantom perceptions such as phantom sound (tinnitus) and phantom pain. His non-clinical research investigates the neural correlates of god perception as a phantom perception of the ‘self’, and moral perception as related to self-perception.

Most of his scientific work is based on an evolutionary approach of brain functioning. He received a PhD in Medical Sciences in 2004 at the University of Antwerp with a thesis titled ‘A Darwinian Neurosurgical Approach to Tinnitus.

He is currently working at the University Hospital Antwerp, Belgium, where he founded BRAI²N, the Brain Research center Antwerp for Innovative and Interdisciplinary Neuromodulation. BRAI²N’s mission is to investigate the common neurophysiological mechanisms of abnormal brain functioning clustering groups of pathologies, such as fibromyalgia, chronic fatigue, obesity, addictions, obsessive compulsive behavior, tics on the one hand, but also stress, depression, posttraumatic stress disorder, etc on the other hand. A third group of pathologies investigated is related to moral transgressions, such as in parafilias, psychopathy, etc.
S P E A K E R S

David Hagedorn, PhD
Dr. David Hagedorn has worked in various clinical and private practice settings for over 20 years. He is experienced in clinical health psychology and neuropsychology and serves as an international neuroscience and biofeedback research consultant and instructor for Biofeedback Foundation of Europe. Dr. Hagedorn is a faculty and staff member at Naval Hospital Camp Lejeune and Assistant Professor of Military and Emergency Medicine and Family Medicine at Uniformed Services University of the Health Sciences - School of Medicine.

Lynda Thompson, PhD
is a Psychologist who has done teaching, clinical psychology, school psychology and owned learning centers. She became Executive Director of The ADD Centre in Toronto in 1993 after discovering the world of Neurofeedback and deciding to specialize in that intervention. Her doctoral dissertation (1979) dealt with hyperactive children treated with methylphenidate. She is co-author with William Sears of The A.D.D. Book: New Understandings, New Approaches to Parenting Your Child. Since beginning a centre for biofeedback she has published 9 book chapters, and 14 journal articles with an emphasis on ADHD, Asperger’s Syndrome, Seizure disorders and stress management. She takes an active part in the main organizations concerning biofeedback, is a past Board Member of both the International Society for Neurofeedback and Research (ISNR) and the Biofeedback Certification International Alliance (BCIA), and was Chair of the Education Committee and Treasurer of the Neurofeedback Division of the Association for Applied Psychophysiology and Biofeedback (AAPB). With her husband, Michael Thompson, M.D. she co-authored The Neurofeedback Book: An Introduction to Basic Concepts in Applied Psychophysiology (2003). They have been invited to teach about neurofeedback and biofeedback in 25 countries on five continents and present frequently at professional meetings in these fields.

Rex Cannon, PhD
Rex L. Cannon completed his doctoral training at the University of Tennessee in Knoxville. He has held the positions of director of cognitive neuroscience and Cole Neuroscience Center at the University Of Tennessee Graduate School Of Medicine and the Clinical Neuroscience laboratory at the University of Tennessee. He has authored numerous research studies using qEEG, LORETA, MRI and fMRI methods.

Ali Hashemian, PhD
Ali Hashemian is the co-founder and CEO of Brain Science International as well as the CEO of American College of Behavioral Medicine, Inc. which owns and operates the five Attention and Achievement Centers located in the San Francisco - San Jose metropolitan areas. Under his supervision, Attention and Achievement Center has provided diagnostic evaluations, QEEG recording and interpretation and non-medication based interventions including neurofeedback (EEG neurofeedback), Auditory Integration Training, Sensory Integration training and coaching to thousands of clients over the past decade. He has completed the Hearing Conservation Certification program at Portland State University and also has completed the Professional Program in Neuropsychological Assessment from the University of California at Berkeley. He has received several hundred hours of continuing education and training in child and adolescent psychiatric disorders from Harvard Medical School, and has completed the intensive course in Repetitive Transcranial Magnetic Stimulation at Harvard. He is a Certified Berard Practitioner, as well as a Certified Solisten (by Tomatis) System provider and an Associate of the International Association of Registered Certified Tomatis Consultants.
Sarah N. Wyckoff, PhDc
Sarah N. Wyckoff, MA, BCN, BCB is post-doctoral researcher in the Department of Psychology at the University of Pennsylvania. She completed her doctoral research under the supervision of Ute Strehl and Niels Birbaumer at the Institute of Medical Psychology and Behavioral Neuroscience at the University of Tuebingen in Germany. As a member of a collaborative ADHD research group, she investigated the application of slow cortical potential (SCP) feedback for the treatment of adults with ADHD.

Jay Gunkelman, QEEGD
Jay Gunkelman, QEEG Diplomate, is recognized as one of the top leaders in the field of EEG and QEEG, and has processed over 500,000 EEGs since 1972. He has served as president of The International Society for Neurofeedback and Research, as well as a board member and treasurer of the Association for Applied Psychophysiology and Biofeedback and is a past-president of the Biofeedback Society of California. Jay was the first EEG technologist to be certified in QEEG (1996) and was granted Diplomate status in 2002. He has conducted, published or participated in hundreds of research papers, articles, books and meetings internationally. He continues to lecture on EEG/QEEG at neuroscience meetings worldwide. He has co-authored the textbook on EEG artifacting (2001). Jay remains busy with current projects and publications related to his seminal paper on EEG endophenotypes (2005, Clinical Electroencephalography). He is co-founder and Chief Science Officer of Brain Science International and is a popular lecturer worldwide on the topic of QEEG and phenotype identification of neurological disorders.

Cynthia Kerson, PhD
Cynthia Kerson is the director of education for BSI. Additionally she is the clinical director of Marin Biofeedback, where she specializes in neurofeedback training for learning disabilities, pain, depression and anxiety. Her comprehensive training techniques are focused on meditation and mind-body awareness. She is also currently the executive director of the ISNR Research Foundation, where she oversees all granted and sanctioned programs for them. Dr. Kerson has published several papers and articles, is a mentor for BCIA and a member of SABA and ISNR. She frequently presents at meetings on neurofeedback and the research projects of the ISNR Research Foundation. She served as executive director of the Biofeedback Society of California from 2004-8 and it currently in her 2nd term as president for them. Cynthia has been a featured speaker at ISNR and served previously as their executive director (2005-2011). In addition to her more academic pursuits, she frequently consults with the media, contributing her expertise to television, including serving as the ‘EEG expert’ for the popular program MythBusters.

Joel Lubar, PhD
Dr. Lubar received both his B.S. and Ph.D. from the Division of the Biological Sciences and Department of Biopsychology at the University of Chicago. He has published more than 125 papers, authored numerous book chapters and eight books in the subject areas of neuroscience and applied psychophysiology. He is also a sought-after editor, currently serving as one of the editors of the Journal of Neurotherapy. He has held the positions of Assistant Professor at the University of Rochester and Full Professor at the University of Tennessee, where he continues on as a professor emeritus. He is a past president of ISNR and AAPB, is a BCN-EEG senior fellow, is a licensed psychologist,
BSI PROFESSIONAL QEEG PROGRAM
Jay Gunkelman, QEEGD
The Professional QEEG Program provides didactic and practical learning in acquisition and interpretation of EEG and QEEG and prepares the attendee for QEEG certification.

Electroencephalogram (EEG) has been used in the medical arena for over 50 years to diagnose sleep disorders and epileptiform behaviors among other things. Neurologists are trained to read raw EEG tracings and have been diagnosing based upon its findings for years. For the past 20 years, quantitative EEG has been in use to help distinguish psychological, as well as other physiological disorders, for example anxiety, ADHD, depression, traumatic brain injury and stroke. Quantitative EEG (QEEG) or brain mapping compares the individual EEG to a normative database consisting of subjects who are of comparable age and sex and during the same task. The use of QEEG greatly improves the ability to accurately design neurofeedback protocols and helps determine the best medication for specific brain wave profiles.

HEART-BRAIN CONNECTIONS PART 1
Lynda Thompson, PhD
These 2 talks will outline important components of the neural networks that are influenced by NFB + BFB training. It will emphasize, but not be limited to, central midline structures (CMS) including the cingulate gyrus, medial frontal, orbital frontal, insula, entorhinal and parahippocampal areas of the cortex, hippocampus, hypothalamus, amygdala, other basal ganglia, thalamus, and brain stem connections with emphasis on the connections of the Nucleus Solitarius. A special focus will be on how heart rate variability (HRV) training has direct effects on many of the same basic neural structures that are also influenced by EEG biofeedback training. Combining EEG biofeedback / neurofeedback (NFB) with peripheral biofeedback (BFB) appears to have effects not only on the neural network(s) concerned with emotions (the affect network) but also on the executive, salience and default networks and their associated functions. In our experience, attention and concentration, as well as other executive network functions, are influenced in a positive manner. There are, additionally, improvements in social behaviour.

BSI NEUROTHERAPY CERTIFICATION PROGRAM
Cynthia Kerson, PhD
Barry Sterman, PhD
This course provides the accredited 36 hours for BCIA didactic. It will cover instrumentation and train on state of the art equipment, Thought Technology Infinity and BrainMaster Atlantis. It is a 3-day F2F course and 10 hour web-based program. It is highly recommended that the 10 hours are taken within the 30 days prior to the F2F instruction. It covers treatment protocols, history of neurotherapy and operant conditioning, ethical considerations and basic neuroscience. This course is essential training for anyone who wishes to incorporate neurotherapy into his or her practice.

APPLIED NEUROSCIENCE FOR THE ASSESSMENT AND TREATMENT OF COMBAT-RELATED HEAD INJURY AND PTSD
David Hagedorn, PhD
The multifactorial nature and high military prevalence of cognitive impairment as a result of brain injury types and PTSD necessitates rapid multimodal analysis and treatment methods that are both cost and clinically effective. Central and autonomic nervous system dysfunction associated with brain injury and PTSD can be easily and reliably quantified with electrophysiology methods. Current neuroscience technologies as quantitative EEG, event related potentials, electrocardiograph statistics, non-invasive brain stimulation (rTMS, tDCS), and special emphasis on brain computer interface (neurofeedback) will be reviewed in the context of case studies. Pre- and post-measures to track medication and other treatment successes or to facilitate objective return-to-duty decisions will be discussed. There will be an emphasis on ease-of-use technology and reimbursement for clinical practices and peak performance programs.

SLOW CORTICAL POTENTIAL FEEDBACK FOR THE TREATMENT OF ADHD
Sarah Wyckoff, PhDc
This introductory presentation will review the history and technical requirements of SCP feedback, review the literature and peer-reviewed/ongoing studies
related to the application of SCP feedback in ADHD, and discuss study limitations and future research needed to investigate the efficacy of this non-invasive, non-pharmacological treatment method in persons with ADHD.

EVIDENCE-BASED MEDICINE: NEUROTHERAPY & EPILEPSY
Robert Turner, MD
Barry Sterman, PhD
This introductory presentation will review the 40+ year history of NT (NeuroTherapy) & NR (Neural Regulation) as it relates to epilepsy, drawing from substantial peer-reviewed literature and broad experience of researchers/clinicians, and discuss needed applications of non-invasive, non-pharmacologic EMAI NFB (Electro-Magnetic Ablative Interruption NeuroFeedBack) in persons suffering from intractable epilepsy.

THE ROLE OF SLEEP IN ADHD
Jay Gunkelman, QEEDG
Current neuroscience publications provide evidence of between 25% and 50% of those with ADHD having an underlying sleep disturbance. These disturbances include circadian rhythm delay, respiratory issues, restless legs, parasomnias and sleep paroxysms. Evidence showing the interaction between ADHD incidence and sun exposure will be provided. Raw EEGs of those complaining of ADHD will be reviewed with orientation to the Vigilance model (Bente, 1964) and sleep staging. Cases with EEGs illustrating the precipitous descent into stage II sleep with eye closure will be demonstrated. Participants will identify the classical sleep stages of drowsiness and sleep onset, stages awake, I and II. Participants will correlate the vigilance model with classical sleep stages. The solar intensity and circadian rhythm delay relationship will be identified by participants.

EVIDENCE-BASED NEUROTHERAPY: STATUS & RECOMMENDATIONS
Barry Sterman, PhD
The general field of “biofeedback” arose from application of the principles of operant conditioning. Kamiya and Sterman used these same principles in launching the field of “EEG biofeedback”, or “neurofeedback”, as it is often called today. Even with the analog methods of the time, controlled animal and human studies were successful in documenting conditioning of EEG and its physiological and clinical correlates. Today, however, methods of both EEG recording and analysis are digital. This advance has allowed for freedom and creativity in the application of EEG biofeedback. Often, however, these options have corrupted adherence to the basic principles of operant conditioning, and most clinical neurotherapy programs report treatment success. Can this success still be due to operant conditioning, or are other factors likely involved? Absent transparent methodology, documented acquisition, and adequate follow-up the true validity of claims, notions, & even reports in relation to neurotherapy cannot be assessed. Other factors cannot be ruled out. The objective of this presentation will be to review current status and demonstrate solutions towards valid and reliable Neurotherapy and meaningful clinical outcomes.

THE BAYESIAN BRAIN: AN OLD ‘NEW’ VIEW ON BRAIN FUNCTIONING AND ITS IMPLICATIONS FOR BRAIN ANALYSIS
Dirk De Ridder, MD
Phantom perceptions arise almost universally in people who sustain sensory deafferentation, and in multiple sensory domains. The question arises ‘why’ the brain creates these false percepts in the absence of an external stimulus? An explanation can be provided by the Bayesian brain model. The Bayesian brain can be conceptualized as a probability machine that constantly makes predictions about the world and then updates them based on what it receives from the senses.

The brain’s main function is to reduce environmental uncertainty, as posited by the free-energy principle, which has been proposed as a universal principle governing adaptive brain function and structure. The free-energy principle states that the brain must minimize its Shannonian (informational) free-energy, i.e. must reduce by the process of perception its uncertainty (its prediction errors) about its environment. As completely predictable stimuli do not reduce uncertainty, they are not worthwhile of conscious processing. Unpredictable things on the other hand are not to be ignored, because it is crucial to experience them to update our understanding of the environment.
LOW-RESOLUTION BRAIN ELECTROMAGNETIC TOMOGRAPHY (LORETA)
Rex Cannon, PhD
This presentation will introduce the audience to Low-resolution brain electromagnetic tomography (LORETA) and its practical applications in clinical and research settings. LORETA, the standard (sLORETA) and exact (eLORETA) versions of this algorithm are methods of probabilistic source estimation of EEG signals in standardized brain atlas space utilizing a restricted inverse solution (Pascual-Marqui, Michel, & Lehmann, 1994; Pascual-Marqui, Esslen, Kochi, & Lehmann, 2002). LORETA has undergone extensive validation by other more established neuroimaging methods such as PET, structural MRI, functional MRI, and SPECT. 1: Understand LORETA neuroimaging methods and validity of results across imaging modalities 2: Understand practical application and limitations 3: Appreciation for the potential for this method in both neurological and psychological contexts.

APPLIED NEUROSCIENCE FOR THE ASSESSMENT AND TREATMENT OF COMBAT RELATED HEAD INJURY AND PTSD
David Hagedorn, PhD
The multifactorial nature and high military prevalence of cognitive impairment as a result of brain injury types and PTSD necessitates rapid multimodal analysis and treatment methods that are both cost and clinically effective. Central and autonomic nervous system dysfunction associated with brain injury and PTSD can be easily and reliably quantified with electrophysiology methods. Current neuroscience technologies as quantitative EEG, event related potentials, electrocardiograph statistics, non-invasive brain stimulation (rTMS, tDCS), and special emphasis on brain computer interface (neurofeedback) will be reviewed in the context of case studies. Pre- and post-measures to track medication and other treatment successes or to facilitate objective return-to-duty decisions will be discussed. There will be an emphasis on ease-of-use technology and reimbursement for clinical practices and peak performance programs.

LORETA DEBATE - CRITICISMS AND POTENTIAL
Rex Cannon, PhD - con position
Barry Stermann, PhD - pro position
CON: This presentation will introduce the audience to several of the criticisms of Low-resolution brain electromagnetic tomography (LORETA) with contrast to other source localization methods.

PRO: A reliable, non-invasive localization of EEG sources within the brain has long been sought for the accurate measurement of electromagnetic waves generated to specific regions of the cerebral cortex. LORETA and the standardized version sLORETA utilize inverse solutions for estimating cortical electrical current density originating from scalp electrodes computed from distributed electrical activity within the cerebral volume. It generates statistical maps, models of the distribution of brain current activity, and utilizes realistic electrode coordinates for a concentric head model providing an accurate approximation of anatomical origins from structures within the neocortical volume. This method has been the subject of numerous publications and may provide an extremely valuable tool for neuroscience research. The question is its value for neurotherapy. Support for this conclusion will be the topic of this presentation.

HEART - BRAIN CONNECTIONS
Lynda Thompson, PhD
This workshop will outline important components of the neural networks that are influenced by NFB + BFB training. It will emphasize, but not be limited to, central midline structures (CMS) including the cingulate gyrus, medial frontal, orbital frontal, insula, entorhinal and parahippocampal areas of the cortex, hippocampus, hypothalamus, amygdala, other basal ganglia, thalamus, and brain stem connections with emphasis on the connections of the Nucleus Solitarius. A special focus will be on how heart rate variability (HRV) training has direct effects on many of the same basic neural structures that are also influenced by EEG biofeedback training. Combining EEG biofeedback / neurofeedback (NFB) with peripheral biofeedback (BFB) appears to have effects not only on the neural network(s) concerned with emotions (the affect network) but also on the executive, salience and default networks and their associated functions.
AUDITORY INTEGRATION TRAINING AS AN ADJUNCT TO NEUROThERAPY
Ali Hashemian, PhD
Auditory Training is a form of feedback although not in the traditional sense of bio-feedback. Based on the initial audiogram assessments, certain frequencies are filtered and others enhanced for the client and a music program is created then client listens to this music for 2 weeks. A new audiogram is done then, and new music created and this process goes on up to 90 hours. We have seen amazing results for our clients over the past ten years. Initially we offered this program to clients with Auditory Processing Disorder but as we saw significant improvements in their attention scores as measured by IVA, we did a study utilizing auditory training with ADHD kids and have observed an even more robust result than neurotherapy. This talk will review the outcome measures of this clinical study.

PANEL: IN SEARCH OF NEURONAL CIRCUITS FOR REWARD AND OPERANT CONDITIONING
Gary Aston-Jones, PhD
SELECTIVE MODULATION OF BRAIN AROUSAL SYSTEMS
Bary Sterman, PhD
BRAIN CIRCUITS ASSOCIATED WITH LEARNING: BASAL FOREBRAIN PATHWAYS
Abstracts to Follow

NON-INVASIVE NEUROMODULATION (TMS, TDCS, TACS, TRNS, LORETA NEUROFEEDBACK): MERELY INVESTIGATIONAL OR TREATMENT TOOLS?
Dirk De Ridder, MD
Many diseases have been linked to plastic changes and changes in activity and functional connectivity in the brain, which can be demonstrated by functional imaging, either using resting state imaging (EEG, MEG, fMRI), or by evoked activity. Many brain related diseases can therefore be seen as emerging properties of altered dynamically changing overlapping networks. Different neuromodulation techniques such as Transcranial Magnetic Stimulation (TMS) and transcranial Direct Current Stimulation (tDCS) have been used in an attempt to modify the abnormal activity and connectivity. Recently, also transcranial alternating current stimulation (tACS) and transcranial random noise stimulation (tRNS) have been introduced as neuromodulation tools, and LORETA neurofeedback is emerging as another non-invasive neuromodulation tool. Each of these neuromodulation techniques has a different proposed working mechanism which could provide help in selecting the right neuromodulation technique that best suits the pathology related functional imaging changes. Except neurofeedback, all these techniques have one common advantage, and that is their non-invasiveness, but as disadvantage that the clinical effect is not lasting, even after repeated treatment sessions, except possibly when the techniques are used as an adjunct, for example in rehabilitation settings. Depending on how long the beneficial effect lasts, the repeated sessions can be performed again or an invasive technique can be applied for longer lasting efficacy. Post neuromodulation changes on functional imaging have been used to claim that correlations between pathology and brain changes are causally related. However, these claims have to be interpreted with care, in order not to fall into a new phrenological trap.
This year SABA and BSI will hold their programs together in beautiful Charleston, South Carolina. Charleston holds the charming atmosphere SABA conferences are known for and is also the home of the Medical University of South Carolina (MUSC), where we have collaborated to bring you some of their top speakers. These BSI certification courses will be unique in that SABA presenters will spend some time at the courses with their attendees.

This combined program stands to be the best of the best of BSI and SABA.

---Cynthia Kerson, PhD, QEEGT, BCN, BCB
Director of Education, BSI & 2013 SABA Program Coordinator

FEES

**BSI Professional QEEG Certification Program**

$995 Individual  
$895 2 or more from same facility  
$550 Student (with proof of enrollment in university)  
Includes group lunch on Friday

**BSI Neurotherapy Certification Program**

$995 Individual  
$895 2 or more from same facility  
$550 Student (with proof of enrollment in university)  
Includes group lunch on Friday

**SABA Program**

$595  
Includes: All lectures as well as group lunch on Friday and full group breakfast and lunch Saturday & Sunday

REGISTER AT WWW.BRAINSINTERNATIONAL.COM

HOTEL INFORMATION

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170 Lockwood Blvd | Charleston, SC  
(843) 723-3000 or (800) 968-3569

Reservations: (800) 968-3569 (mention code bsibsia) or online through the BSI site

**Book Early!**  
$149/night before April 5, $179 after April 5