

ERICE INTERNATIONAL SCHOOL OF NEUROSCIENCE
Directors: Giacomo Rizzolatti & Pierfrancesco Ferrari

Workshop on:
***THE ROLE OF THE AUTONOMIC
NERVOUS SYSTEM IN
STRESS RESPONSE & RESILIENCE***

Erice, June 8-13, 2025



Organizers:
ANDREA SGOIFO, CRISTINA OTTAVIANI & NICOLA MONTANO

Workshop venue:
ETTORE MAJORANA FOUNDATION AND CENTRE FOR SCIENTIFIC CULTURE
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POETIC TOUCH

According to legend Erice, son of Venus and Neptune, founded a small town on top of a mountain (750 meters above sea level) more than 3 thousands years ago. The founder of modern history – i.e. the recording of events in a methodic and chronological sequence as they really happened without reference to mythical causes – the great Thucydides (around 500 B.C.), writing about events connected with the conquest of Troy (1183 B.C.) said: “ After the fall of Troy some Trojans on their escape from the Achaei arrived in Sicily by boat and as they settled near the border with the Sicanians all together they were named Elymi: their towns were Segesta and Erice”. This inspired Virgil to describe the arrival of the Trojan royal family in Erice and the burial of Anchise, by his son Enea, on the coast below Erice. Homer (around 1000 B.C.) , Theocritus (around 300 B.C.), Polybius (around 200 B.C.), Virgil (around 50 B.C.), Horace (around 20 B.C.) and others celebrated this magnificent spot in Sicily in their poems. During seven centuries (XIII-XIX) the town of Erice was under the leadership of a local oligarchy, whose wisdom assured a long period of cultural development and economic prosperity which in turn gave rise to the many churches, monasteries and private palaces which you see today.

In Erice you can admire the castle of Venus, the Cyclopean walls (around 800 B.C.) and the Gothic Cathedral (around 1300 A.D.). Erice is at present a mixture of ancient and medieval architecture. Other masterpieces of ancient civilization are to be found in the neighborhood: at Motya (Phoenician), Segesta (Elymian), and Selinunte (Greek). On the Aegadian islands – theatre of the decisive naval battle of the first Punic War (264-241 B.C.) – suggestive neolithic and paleolithic vestiges are still visible: the grottoes of Favignana, the carvings and murals of Levanzo. Splendid beaches are to be found at San Vito Lo Capo, Scopello, and Cornino, and a wild and rocky coast around Monte Cofano: all of them at less than one-hour drive from Erice.

PURPOSE OF THE WORKSHOP

Research, both clinical-epidemiological and experimental on humans and animals, has broadly revealed a tight link between stress and somatic/psychological dysfunctional states. Acute and chronic life stressors, psychological alterations such as anxiety and depression, personality traits such as anger and hostility, as well as the absence of social support have all been shown to interfere with and modulate the onset and progression of a number of disease conditions. Solid evidence shed light on the role of the autonomic nervous system (patho)physiology and its higher neural regulators in stress related pathology and resilience. However, despite a growing number of empirical investigations and accumulating clinical evidence, still several issues remain to be clarified about the actual mechanisms linking stress, symaptho-vagal balance and health risk profiles and features of individual resilience.

This workshop will present the newest scientific evidence in the multidisciplinary arena intersecting stress, the autonomic nervous system and psychosomatic conditions, as well as the most promising approaches aimed at accurately measuring autonomic neural modulation and fostering stress resilience through vagal nourishment.

Sunday 8 June 2025

ARRIVAL DAY & REGISTRATION

It takes about 1.5 hr from the airport of Palermo and less than 1 hr from the airport of Trapani to get to Erice. Please register at the workshop venue (Centro di Cultura Scientifica Ettore Majorana, Istituto S. Rocco, via Guarnotta 26, Erice) on the 8th of June 2025, not later than 6 p.m. Your room will be in the S.Rocco Institute itself or in the other locations of the Majorana Center, walking distance from the workshop venue. As soon as you get the badge, you're allowed to go to one of the restaurants that have an agreement with the Ettore Majorana Center. Anyway, a welcome get together will take place at around 9.00 pm in the "Marsala Room" of the S.Rocco Institute.



Monday 9 June 2025 - AM

Opening

10.00-10.30 – Andrea Sgoifo (Parma, Italy) – Introduction. Stress and the autonomic nervous system: the parasympathetic chance for resilience

(Chair: Cristina Ottaviani) (10.30-12.40)

10.30-11.10 – Jim Herman (Cincinnati, USA) – The integrative biology of stress

11.10-11.40: Coffee

11.40-12.20 – Viola Vaccarino (Atlanta, USA) - Stress response physiology and coronary heart disease: moving from the lab to real life

12.20-12.40 – Angelica Carandina (Milano, Italy) - Unloading gravity, unveiling resilience: autonomic responses to bed rest as a model for spaceflight

Lunch

Monday 9 June 2025 - PM

(Chair: Nicola Montano) (15.00-18.30)

15.00-15.40 – Pascal Carrive (Sidney, Australia) - The defence cascade and its cardiovascular component

15.40-16.20 - Luca Carnevali (Parma, Italy) - The importance of sex for the autonomic determinants of stress resilience

16.20-16.40 – Margherita Barbetti (Parma, Italy) - Sex-specific cardiac autonomic responses to repeated taVNS in rats

16:40-17.20 – Susan Wood (Columbia, USA) - Neuroimmune regulation of stress-induced behavioral and autonomic hypervigilance

17.20-17.50: Coffee

17.50-18.10 – Lauren Bylsma (Pittsburgh, USA) - Ambulatory psychophysiological associations with self-reported overwhelming sensory experiences and regulatory behaviors in daily life in autistic adults

18.10-18.30 – Frances Meeten (London, UK) - An experimental investigation of the effects of resonance frequency breathing on symptoms of anxiety

Dinner

Tuesday 10 June 2025 - AM

(Chair: Viola Vaccarino) (09.00-12.30)

9.00-9.40 – Ivan De Araujo (Tübingen, Germany) - Central and parasympathetic control of peripheral immunity

9.40-10.20 – Roe Admon (Haifa, Israel)- Trauma under psychedelics: clinical, behavioral, physiological and neural account

10.20-10.40 – Sylvain Laborde (Köln, GER) - Resting vagally-mediated heart rate variability (vmHRV) and subjective self-reported variables in athletes: a scoping review

10.40-11.10: Coffee

11.10-11.50 – Julian Thayer (Irvine, USA) - Psychophysiological responses to unfair treatment

11.50-12.30 – Vaughan Macefield (Melbourne, AUS) - The effects of experimental muscle pain on muscle sympathetic nerve activity, skin sympathetic nerve activity and brain activity in humans

Lunch

Tuesday 10 June 2025 - PM

(Chair: Julian Thayer) (15.00-18.30)

15.00-15.40 – Nicola Montano (Milano, Italy) - Transauricular vagal nerve stimulation in functional and chronic diseases: does one size fit all?

15.40-16.00 – Vera Jandackova (Ostrava, CZE) - Effects of 2-week transcutaneous vagus nerve stimulation on cognition, affective well-being, and cardiac vagal modulation: results from randomized placebo-controlled trials

16.00-16.40 – Doug Bremner (Atlanta, USA) - Effects of vagus nerve stimulation on autonomic function in stress and opioid withdrawal

16.40-17.10: Coffee

17.10-17.50 – Omer Van den Bergh (Leuven, BEL) - The affect and symptom paradigm (ASP): a review of findings

17:50-18.30 – Caroline Sevoz-Couche (Paris, France) - The effect of vagus nerve stimulation in lung inflammation in a model of allergic asthma

Dinner

Wednesday 11 June 2025 – AM & PM

TRIP TO ARCHEOLOGICAL SITES

A bus will bring us to Segesta and Selinunte, two of the most beautiful archeological attractions of Sicily. Lunch in a restaurant in between the two visits.



Thursday 12 June 2025 - AM

(Chair: Caroline Sevoz-Couche) (09.00-12.30)

9.00-9.40 - Sarah Garfinkel (London, UK) - Dimensions of interoception and their implications for psychopathy

9.40-10.20 – Giovanni Calcagnini (Roma, Italy) - Non-invasive assessment of sympatho-vagal balance: beyond heart rate variability and head-up tilt test

10.20-10.40 - Jolien Braet (Gent, BEL) - The immediate effects of a resonant breathing exercise on adolescents' stress responses

10.40-11.10: Coffee

11.10-11.50 – Cristina Ottaviani (Roma, Italy) - Targeting the autonomic nervous system with bottom-up and top-down interventions: a precision psychiatry approach

11.50-12.10 - Beth Longley (London, UK) - The Em-Body study: exploring the link between interoception, emotion, and mental health

12.10-12.30 – Vanessa Era (Roma, ITA) - Ingestible pills reveal parasympathetic withdrawal affecting gastric activity in virtual reality induced stress

Lunch

Thursday 12 June 2025 - PM

(Chair: Ivan De Araujo) (14.30-15.30)

14.30-14.50 - Rania Iman Virjee (London, UK) - Methodological approaches to derive the heartbeat-evoked potential: past practices and future recommendations

14.50-15.10 – Darcianne Watanabe (USA) - Emotion suppression: a differential link between stress and cardiovascular disease risk in Japanese and Americans

15.10-15.30 – Gabriel Dias Rodrigues (Milano, ITA) - Training respiratory muscles to improve sympatho-vagal and inflammatory balance: results from a clinical trial in systemic sclerosis patients

15.30-17.30 - Posters with Coffee

Hajar Al Naqshbandi (ITA) - Characterising the psychophysiological experience of being underweight or obese: preliminary evidence from a virtual reality study

Daniele Bomarsi (ITA) – Biological impact of sexual minority stress: the role of emotion suppression in the cardiovascular conundrum

Alexia Crockett (USA) - Chronic unpredictable stress alters brain mitochondrial function and behavior

Sylvia De Napoli (ITA) - Perceived stress, gut-microbiota, and heart rate variability in depression vulnerability: a sex-dependent perspective in healthy subjects

Jente Depoorter (BEL) - Spontaneous emotion regulation after experimental stress: effects on physiological recovery and mental well-being

Rubens Fazan (BR) - Decoding cardiovascular variability and baroreflex function in clear cell renal carcinoma: insights into autonomic regulation

Heleen Goemaere (BEL) - The role of emotion reactivity and regulation in understanding adolescent depressive symptoms: investigating both psychological and physiological measures

Rachele Grimaldi (ITA) - Enhancing motivational drive: impact of auricular vagus nerve stimulation on reward-related behavior

Susan Herman (USA) - Integrative biology of stress adaptation and pathology

Francesca Magna (ITA) - Diaphragmatic breathing enhances cardiac vagal modulation: a potential countermeasure to psychophysical stress

Giorgia Mason (ITA) - Positive subjective experience during a Joint-Action Task increases parasympathetic control over cardiac activity

Arianna Mastrocesare (ITA) - Attachment anxiety and selective spatial attention: a behavioral and ERP investigation

Tim Philbeck (USA) - Gestational witness stress induces long-term alterations in postpartum behavior, and cardiovascular health in association with altered autonomic function

Caterina Piras (ITA) - Cardiovascular risk in healthy young adults: the impact of early-life stress and autonomic dysregulation

Giuseppina Porciello (ITA) – Comparing the effects of mindfulness and cognitive training on cardiac and gastric responses to stressful virtual scenarios

Sebastiano Ravenda (ITA) - Autonomic and neuroimmune mediators linking chronic psychosocial stress to atherosclerotic cardiovascular disease destabilization: the STRESS-MI ACTION study

Greta Salafia (ITA) - Efficacy of repetitive transcranial magnetic stimulation (rTMS) and transcutaneous auricular vagal nerve stimulation (tVNS) on depressive symptom and stress: evidence from DEPONEST and DIGEST studies

Andrea Salaris (ITA) - Psychophysiological response to acute stress and interoceptive patterns in Borderline Hypertension: Insights for clinical relevance

Giuseppe Salvo (ITA) - Understanding the paradox: meta-analytic insights on discrimination and heart rate variability

Martino Schettino (ITA) – GABA- and glutamate-mediated neurometabolic correlates of autonomic dysregulation in repetitive negative thinking

Maximilian Schmausser (GER) - Effects of long-term transcutaneous auricular vagus nerve stimulation on circadian vagal activity in people with Prader-Willi Syndrome: A case-series

Thais Silva (BR) - Heart-rate fragmentation reveals vagal shifts: insights from a graded head-up tilt test

Anouk Teugels (BEL) - The effects of slow breathing on different stress-related outcomes: A study protocol

Marieke Weijs (SWI) - The modulation of cortical and cardiovascular arousal markers via volitional control of pupil size

17.30 – Final remarks, discussion and take home messages

(Chairs: Nicola Montano, Cristina Ottaviani, Andrea Sgoifo)

Altogether dinner 20.00

Friday 13 June 2025

DEPARTURE DAY

Dispiegarsi del paesaggio, del suo variare, del suo sciogliersi nei colori e nella luce. Ma vi è implicita anche la profondità della presenza umana, della storia umana nella sua particolarità e insomma di quel rapporto tra la natura e l'uomo per cui la natura produce una particolare civiltà e quella civiltà impronta di sé la natura: circolarità che si ripete in ogni luogo abitato dall'uomo, in ogni luogo che ha storia; e che Borges condensa nel paradosso che spostando un pugno di sabbia un uomo modifica il deserto.

The landscape unfolding, changing, dissolving in colours and light. Yet the depth of human presence is implicit in it too, human history in its particularity, the relationship between nature and man such that nature produces one particular civilisation and that civilisation leaves its own mark on nature: circularity which repeats itself in any place inhabited by man, in any place with some history, what Borges condenses in the paradox that by moving a fistful of sand a man modifies the desert.

Rincaso' verso mezzanotte, attraversando tutta la città a piedi. Parma era incantata di neve, silenziosa, deserta. "In Sicilia le nevicate sono rare", pensò: e che forse il carattere della civiltà era dato dalla neve o dal sole, secondo che neve o sole prevalessero. Si sentiva un po' confuso. Ma prima di arrivare a casa sapeva, lucidamente, di amare la Sicilia: e che ci sarebbe tornato.

He went home at about midnight, walking through the town. Parma was enchanting in the snow, silent, deserted. "It rarely snows in Sicily", he thought, and that perhaps the character of a civilisation was determined by snow or sun, depending on whether snow or sun prevailed. He felt a little confused. Yet before reaching home he clearly realised he loved Sicily and that he would go back.

(Leonardo Sciascia, Sicilian writer, "Il giorno della civetta" - "The day of the owl", 1961)

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