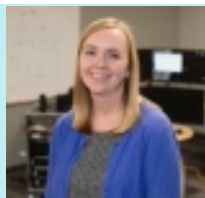


# Brain-Computer-Interface Society

Note from the president



Dear friends,

It is hard to believe that the end of summer is nearing! The BCI Society kicked off the summer with our first Virtual Meet-Up Event, which was organized by the Postdoc and Student Committee. I enjoyed having the chance to connect with both new and familiar faces. Approximately 100 people registered for this event. I'd like to give a special thanks to Fatih Altindis, Luke Bashford, Stephanie Cernera, Marie Constance Corsi, and Davide Valeriani for organizing this event. Thank you also to Tashiana Bryant-Myrick, the Director of California Institute of Technology's Center for Inclusion and Diversity for hosting an informative and interactive session on diversity, equity, and inclusion. I also sincerely appreciate the support of our partners who sponsored the event and those of you who served as mentors for speed dating or hosted a table at the job fair.

We also held the annual General Assembly Meeting where we provided an update on Society activities and finances from the past year. Thank you to everyone who attended and provided feedback. If you weren't able to attend the meeting, you can find the recording on the member area of the BCI Society website.

In the coming months, the Scientific Program Committee will be hard at work planning the 2023 BCI Society Meeting that will take place June 6-9, 2023 in the Sonian Forest in Brussels, Belgium. We welcome any suggestions that you might have for the meeting program. In the meantime, please check out our website for more information about upcoming BCI Thursday events to stay involved! I hope you all had a restful and healthy summer.

Jen Collinger, President of the BCI Society

## Interview with Professor Andrea Kübler

In each of the BCI Society newsletters, we aim to put a senior BCI researcher in the spotlight. For this edition, we asked Professor Andrea Kübler to answer a list of interview questions about her career path, her research and her opinion on the latest developments in the field. We would like to thank Professor Kübler for her insightful and inspirational answers.



**Could you tell us a bit about your background, education and career path until now? When and where did you join the BCI field? What is your current position and what is the composition of your research team?**

I joined the BCI field when it was hardly termed and known by that abbreviation, i.e. in 1996, kind of in my previous life. I was looking for a PhD in which I could combine my background at the time, microbiology, and my new undergraduate, and later postgraduate, studies of psychology. Then someone recommended to talk to "Birbaumer", he would like biologists. He was looking for someone who would do the research and measurements with

### In this issue:

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### Highlights:

- Meet your newly elected BCI Board Members
- Call for the Lifetime Achievement Award
- Have you heard about..... the BNCI Horizon 2020 data base?

# Interview with Professor Kübler continued

neurofeedback and severely paralyzed patients. So, we started classic long-term neurofeedback training with our very first patient in the locked-in state diagnosed with amyotrophic lateral sclerosis. He was trained to self-regulate slow cortical potentials with our system called Thought Translation Device. I went to his home 3 times a week throughout the 4 years of my PhD.

## What attracts you to BCI research?

To learn more about capacity of the brain and the combination of basic and applied science; the contact to patients in the field.

## What, in your opinion, has/have been your most significant contribution(s) to the BCI field?

Good question. To provide patients in the locked-in state with a communication device requires that we do research with those patients in the field. I hope that this is now textbook knowledge in the BCI field. I believe, that I contributed substantially to make this clear. And of course, the Brain Painting application which has been used for years by two artists in the locked-in state at their home.

## What do you enjoy most in your current position or in BCI research in general?

I am now a Professor of Psychology and I absolutely appreciate the freedom of research and teaching. In BCI research I like the multi-disciplinarity of the field.

## What do you consider new important and positive developments in the BCI field?

I think there was a lot of progress toward user friendliness and using BCI as a rehabilitation tool. I am very happy that now many researchers consider the human being in the loop, i.e. psychosocial aspects are now much more integrated in research as compared to former days. Also the recognition of brain states and the possibility to feedback complex brain activity such as connectivity are quite thrilling developments.

## What aspect or development worries you?

Promises made – both from researchers and companies – that cannot be kept and that may harm the reputation of the field. In the 60s and 70s of the last century we saw the hype about the potential of neurofeedback, that turned out to be not as mighty as was promised and advertised, hampered the neurofeedback field for decades.

## What advice would you give to junior researchers entering the BCI field now?

Study the “old” literature and be aware of what has been done, not only the past 5 years, but also longer ago.

## You always had a strong focus on how feedback has to be given in the closed loop, is this sometimes underestimated by BCI researchers?

Well, I believe it quite depends on the focus of the individual researcher. If you wish to provide a communication or rehabilitation tool, if you wish to change a specific brain activity, the closed loop is a sine-qua-non.

## You worked a lot with patients (e.g., ALS) and their restoration of communication. What is the main message to newcomers in the field?

Listen closely to experts (scientists and patients), observe, and think thoroughly of what you would like to know, formulate your hypotheses, design the experiment properly, and be modest with your conclusions. And instead of the credo with which I grew up scientifically “publish or perish”, value and follow “quality over quantity”.

## Related to the question before, what is the missing link for a „real“ use of BCIs outside the lab?

I am answering for a clinical application of BCI: an investment in applied research that brings together all necessary stakeholders, i.e. scientists, experts in translation of technology including health care providers, companies, and health insurances, patient organizations and of course the patient end-users.



# Meet the new faces in the BCI Society Board

In spring of every year, several BCI Society Board members end their 3-year term and new members are chosen. This year, the terms of Aysegul Gunduz, Jane Huggins and Theresa Vaughan ended, with Theresa being eligible for a second term. In the elections, you chose Davide Valeriani, Dean Krusienski and Theresa Vaughan to join the Board. We congratulate Davide, Dean and Theresa with their election, and hereby present to you the two new faces in the team. Also, we thank Aysegul and Jane for their great service to the BCI Society. Their contribution has helped to shape the Society into a flourishing community with interesting, lively and interactive meetings!

## David Valeriani, Lead Data Scientist, Neural Inc, Boston, USA

It is a great honor for me to serve on the Board of the BCI Society and have the chance to contribute to shape the future directions of the field with some of the best BCI researchers in the world. My research interests are in the area of non-invasive BCIs for enhancing human capabilities, with a particular emphasis on decision-making and productivity. During my PhD at the University of Essex, I developed and validated a collaborative BCI framework to enhance group decision making, and in my postdoc I explored the usage of BCI as treatments for movement disorders.

Currently, I am the lead data scientist at Neurable Inc, a Boston-based startup developing the everyday BCI in the form of EEG headphones. I strongly believe the BCI Society plays a vital role in enabling our community to share ideas and accelerate research and innovation. I joined the Society in 2018, when I attended my first BCI meeting in Asilomar, and in 2020 I became a more active member by proposing and leading the creation of a committee to represent students and postdocs, which organized a number of different free initiatives for career and professional development, including the BCI Thursdays and the virtual meetup this year.



As a Board member, I will continue my work in broadening the Society's purpose and offering of events, increase collaboration with academic and industry stakeholders, and ensure equal representation of members around the world.

## Dean J. Krusienski, Virginia Commonwealth University

I am a Professor and Graduate Program Director of Biomedical Engineering at Virginia Commonwealth University in Richmond, Virginia, where I also direct the Advanced Signal Processing in Engineering and Neuroscience (ASPEN) Laboratory. Research in my lab initially focused on the development of EEG signal processing and machine learning schemes to improve non-invasive BCI performance for the severely disabled, and progressed to conducting original experiments for characterizing and translating intracranial brain activity in humans for BCI applications.



We are currently working on a variety of projects involving intracranial speech decoding and synthesis, EEG signal characterization and modeling, music perception, user-state estimation, visual and auditory attention, ergonomics, and virtual reality applications.

As a founding member of the BCI Society and a long-time contributor to the International BCI Meetings, I am enthusiastic about joining the board to help vitalize and grow the society.

# New Post Doc and Student Committee Co-Chairs

Here we introduce to you the new co-chairs of the Postdoc and Student Committee of the BCI Society. You will learn more about the other new members of this committee in the next newsletter.

## Stephanie Cernera, University of California

### Could you tell us about your current position and research?

I am a postdoctoral fellow at the University of California, San Francisco in the Department of Neurological Surgery. My research relies on the analysis of cortical or subcortical signals recorded from patients with movement disorders, such as Parkinson's disease, who receive deep brain stimulation (DBS) therapy. These analyses aim to find a control signal for adaptive DBS. Additionally, I investigate ways to decode at-home neural data using multimodal signal acquisition.



### Could you tell us why you signed up for the postdoc and student committee and what you would like to accomplish during your term?

I volunteered for the PSC to develop initiatives that focus on career development for trainees that would be relevant across various disciplines and careers (e.g., academia, government, or industry). During my term as co-chair, I hope to facilitate the creation of new initiatives that will foster knowledge among trainees. I also aim to increase the visibility of the PSC and current initiatives – such as recordings available on the BCI website - which are beneficial for current or future BCI trainees.

## Marie-Constance Corsi, Paris Brain Institute

### Could you tell us about your current position and research?

I am currently a postdoctoral researcher but in October, I will start a new position as an Inria research scientist at Paris Brain Institute. My research focuses on the integration of multimodal data to improve brain decoding, the development of tools to bring systems outside the laboratory, and the search for reliable neurophysiological markers of training to conceive tailored programs.

### Could you tell us why you signed up for the postdoc and student committee and what you would like to accomplish during your term?

I signed up for the PSC to propose new ways to make the students include students in the BCI Society independent of their background. During my term, I would like to enhance the interactions between the committee and the students to create a dedicated network and to ensure that the existing initiatives are still relevant for the students. I am particularly interested in developing initiatives to help trainees in their research. I plan to involve more experienced researchers during the "trainee spotlight" event to provide advice to the students.



## Luke Bashford, Caltech and the T&C Chen Institute for Neuroscience Brain-Machine Interface Center

### Could you tell us about your current position and research?

I am a senior postdoctoral scholar at Caltech in the Division of Biology and Biological Engineering, and the T&C Chen Institute for Neuroscience Brain-Machine Interface Center. My research explores both the basic science and clinical translation of human sensorimotor and cognitive function. By recording and stimulating intracortically in humans we seek to explore the overlap between the neurophysiological states evoked naturally and through stimulation for similar behaviors.



### Could you tell us why you signed up for the postdoc and student committee and what you would like to accomplish during your term?

I joined the PSC to support Diversity, Equity and Inclusion initiatives that will promote the membership of the BCI Society, evolve to meet the needs of our growing community and set an example for others in our field and beyond.

Become a Member or renew your BCI Society membership today

Membership in the BCI Society is open to all scientists, principal investigators, postdocs, and students from around the world involved in the many research and practical aspects of BCI research. We welcome all involved in BCIs, including engineers, doctors, therapists and business people.

**What are some of the benefits for members?**

- Discounted registration for the BCI Society Workshop Series
- Complimentary registration for the Next Generations events
- Complimentary registration for the Master Classes
- Access to member-only initiatives and activities
- Free access to the online edition of the International peer-reviewed journal Brain-Computer Interfaces

**Our one or two-year membership cycle has started in January 2022!**

**For one year:**

Student: \$65 USD  
 PostDoc: \$95 USD  
 Regular: \$135 USD

**For two years:**

Student: \$95 USD  
 PostDoc: \$145 USD  
 Regular: \$195 USD

For more information, please visit the BCI Society webpage <http://bcisociety.org>

# Society News and Views

## BCI Society Poster

The BCI Society is always happy to welcome new members and thereby improve interaction and collaboration among BCI researchers, clinicians, industry, non-profit organizations, end-users, government entities, and others active in BCI research and development. To create more awareness about the BCI Society, we have developed a poster (<https://bcisociety.org/wp-content/uploads/2022/01/BCI-Flyer-Final.pdf>). If you are planning to attend or present at a symposium or conference, we invite you to take the poster with you (in large format or as handouts) and invite people to join! Members are also welcome to share this poster through university websites or other venues where our poster may be of interest.

## The BCI Society Lifetime Achievement Award 2022

After the 2020 and 2021 Early Career Awards, the BCI Society is pleased to announce the call for nominations for the inaugural BCI Society Lifetime Achievement Award. The BCI Society Lifetime Achievement Award honors outstanding scientists who have made significant contributions to the BCI field, throughout their career. This award is designed to recognize the work of scientists who have served the cause of BCI with passion and commitment to achieving excellence in research and mentorship, and who have contributed significantly to building and maintaining the BCI community.

Nominees should be more than 10 years past their first terminal degree and must be nominated on behalf of three nominators. Deadline for nominations: November 1<sup>st</sup>, 2022. <https://bcisociety.org/lifetime-achievement-award/>



## Did you know... about the BNCI

Some years ago, several members of the BCI Society were partners in a project funded by the EU called BNCI Horizon 2020. In collaboration with many other top experts in BCIs and related fields, this project initiated, among others, an open access database for BCI datasets.

The database can be found HERE\* and currently contains 29 well-curated EEG, ECoG and fNIRS datasets from healthy participants and people with motor impairment. Also, several links to other data resources are provided.

We would like to grow this database and include your data. We also would like to share links to your data that you published somewhere else, for example as part of a dataset paper.

We encourage anyone who has data that could be of value for others to contact Gernot Müller-Putz\*\* for instructions on publishing data in the database. In the last 12 months, more than 21k people visited the database.

Together, we can make sure that this data is used to its fullest extent!

\* <http://bncl-horizon-2020.eu/database>

\*\* [gernot.mueller@tugraz.at](mailto:gernot.mueller@tugraz.at)

# Interview with our Early Career Award Methods winner

Frank Willett, Stanford University

## Tell us about your early career journey and your area of research.

When my undergraduate mentor showed me a microelectrode array and invited me to hold it in my hands for the first time, I was fascinated! I continued in intracortical BCI research thereafter, motivated by pursuing the intersection of computation, neuroscience, and medicine that BCIs offer. As a graduate student at Case Western, I worked to combine muscle stimulators with an intracortical BCI to restore movement to a person with spinal cord injury. It was the first demonstration of a BCI + muscle stimulation system that restored continuous arm and hand motion, enabling a person with tetraplegia to perform coordinated functional actions such as reaching for a mug of coffee. As a postdoc at Stanford University, I led a project to create a high-performance communication BCI using handwriting. This intracortical BCI can decode attempted handwriting movements from motor cortex and translate it to text in real-time, achieving typing speeds that exceed those of any other BCI yet reported (90 characters per minute). My other postdoctoral project focused on understanding how different body parts are represented in motor cortex at single neuron resolution. This work led to a surprising finding: what was previously thought to be “arm/hand” area of motor cortex actually contains an interlinked representation of the entire body!

I'm currently a research scientist working with Prof. Krishna Shenoy and Prof. Jaimie Henderson on a project to restore speech to a person with paralysis who can no longer speak intelligibly. Working as a research scientist allows me to focus solely on what I love: scientific ideation, boots-on-the-ground research, and technical leadership and excellency.

## Who has had the biggest influence on your current research and why?

Prof. Krishna Shenoy has taught me to strive to make a big impact by outperforming the state of the art in a careful, thorough, and controlled way that makes serious progress on root problems and fundamental questions.



## What is the best part of your work?

BCIs offer the promise of leveraging computation and brain science to help people with paralysis. I love being able to challenge myself with interesting computational problems and to confront the mystery of the brain, in a way that feels meaningful and directly impactful for people.

## How do you perceive this award to help you professionally / further develop your career?

I'm grateful to have my work recognized as important in the field. As such, I hope this award can confer some legitimacy to the career path of being a research scientist that continues to do boots-on-the-ground technical work, as opposed to the traditional professorship path.

## What do you think are the main challenges facing early career researchers in the BCI field?

One problem is how difficult it is to do intracortical work in people.

It requires a big team, a lot of resources, and it can be risky to rely on it for a steady stream of research output – this poses a challenge for new professors in the field.

## Looking back, what advice do you have for someone just commencing their PhD/Post-doctoral studies within the BCI field?

Try to identify the root problems holding BCIs back and make fundamental progress on understanding them better. Sometimes it's easy to get caught up in making compelling demonstrations instead of advancing fundamental understanding!

## Tell us something about your future plans.

I plan to continue working at the Neural Prosthetics Translational Laboratory (NPTL) as a research scientist, where I will be focusing on intracortical speech BCIs that have the promise of restoring communication to people with paralysis at unprecedented speeds.

**Check the next newsletter to learn more about  
the ECA Neuroscience winner of 2021:  
Camille Jeunet!**

# BCI Society Committee Updates



In the past 6 months, the Awards Committee has implemented the second edition of the Early Career Awards and was excited to announce two outstanding young researchers as the winners of the Neuroscience and Methods categories. Please take a look at page 6 to get to know more about the ECA Methods winner, Frank Willett. A brief interview with the

ECA Neuroscience, Camille Jeunet, is scheduled to be included in the next newsletter. We congratulate both winners and look forward to hearing more about their work in the future. We want to thank once more the jury members of this year's ECAs: Luigi Bianchi, Ricardo Chavarriaga, Febo Cincotti, Karunesh Ganguly, Robert Gaunt, Ning Jiang, Virginia De Sa and Aleksandra Vuckovic.

In addition, we have worked on developing the call for nominations for the inaugural edition of the BCI Society Lifetime Achievement Award. See page 5 for the call for nominations, and make sure to submit your nomination in time!



The Communications Committee is there to keep you connected and informed! For that, we use multiple channels, such as this newsletter and the Resources tab of the BCI Society website.

In real life, however, and within the research community, social media are becoming increasingly important for exchanging information and for remaining up-to-date about important developments and about interesting events that are coming up. The Communications Committee and the BCI Society are therefore happy to share that we have expanded our presence on social media channels. Apart from Twitter, you and all other BCI stakeholders can also connect to the BCI Society via our LinkedIn channel, where we will share news and updates. In addition, we acknowledge that Twitter and LinkedIn may not be accessible in all parts of the world. Therefore, we offer the possibility to receive BCI Society updates via Wechat. If you want to make use of the latter option, please contact the Communications Committee via [communications@bcisociety.org](mailto:communications@bcisociety.org). We look forward to connecting!

To make sure we can keep up the good work, we need your help! Please let us know about all the interesting events that you are organizing (<https://bcisociety.org/affiliated-events/>) and about any job opportunities your lab may have. Also, we invite you to contact us if you have datasets that you can share in the BCI Society

database, and to send us the link to any BCI-related dataset paper that you have published. Together, we can make sure that the BCI Society database continues to grow and that precious data is used to its fullest extent!

If you are interested in getting involved in the activities of the Communications Committee, do not hesitate to contact us, via [communications@bcisociety.org](mailto:communications@bcisociety.org).



Following the establishment of a fundraising committee in 2021, we have been involved in establishing and writing the framework for a successful partnership with the BCI Society that will be implemented for all possible sponsors of the BCI Society.

We have been working towards securing funding for our BCI Society Awards, the Trainee Collaboration Projects, Future events (e.g. BCI Thursdays) and Social events (e.g. the SFN social).

The mandate of the committee is to assist the Society in the planning, coordination and implementation of all fundraising activities in support of the projects and activities of the society. If you would like to sponsor the BCI Society or if you would like to share any thoughts related to sponsoring, please contact the head of the Fundraising Committee, Prof. Natalie Mrachacz-Kersting (email: [natalymk@icloud.com](mailto:natalymk@icloud.com)).



The Membership Committee (MC), together with the Postdoc and Student Committee (PSC), continues to seek ways to expand and support the membership. These include member discounts for registration to the BCI Society Workshop Series, and access to member-only initiatives and

activities. The three Trainee Collaboration Project (TCP) presented their results at the Virtual Meet Up June 2022. We welcome your input, and your participation in developing and implementing new member benefits.

If you want to learn more or if you want to participate, please email: [members@bcisociety.org](mailto:members@bcisociety.org).

# BCI Society Committee Updates



The Postdoc and Student Committee (PSC) of the BCI Society seeks to enhance the experience of student and postdoc members by organizing and overseeing initiatives answering their professional and career development needs in the context of BCI research. The Committee also aims to provide a

voice within the BCI Society for students and postdocs, and serves as a venue to discuss issues of concern and interest to students and postdocs.

In 2022, we have hosted four events so far: a career advice panel, an Industry-Academia talk, a trainee Spotlight and a two-part BCI science fiction event.

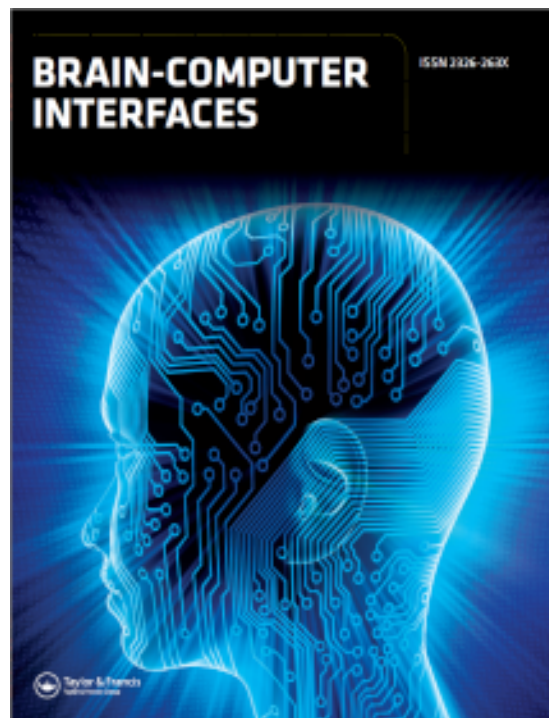
The career advice panel took place on March 17<sup>th</sup>, 2022. The topic was non-traditional career paths in the BCI community. The panellists were Kaitlyn Casimo, an educator and outreach leader at the Allen Institute, Katherine Pratt, a Program Manager at Microsoft, and Ingrid Wickelgren, a Freelance Science Writer & Editor. Panellists explained how they navigated opportunities to find their unique career paths, how their education, training, or volunteer skills transferred to their current roles, and made suggestions on how students might determine which career path is best for them. Our next career advice panel is scheduled for December 2022.

In April, we hosted our first Industry-Academia talk of 2022. The speakers included Dan Wetmore, a research scientist of Meta, and Silvestro Micera, Professor of biomedical engineering at Ecole Polytechnique Federale de Lausanne and Scuola Superiore Sant'Anna. Speakers presented their exciting work surrounding neuroprosthetics and non-invasive neural interfaces, as well as provided more information about career paths in their respective spaces. Our next Industry-Academia talk is scheduled for October 2022 where we will hear from Dr. Jennifer Collinger (our very own President!) and Dr. Matt Angle, CEO of Paradromics Inc.

The trainee spotlight is an opportunity for BCI trainees to receive feedback on their work from experienced researchers, which is often scarce. It is hosted twice per year, with the most recent session occurring on May 26<sup>th</sup>, 2022 with talks by Nibras Abo Alzahab (Marche Polytechnic University), Konstantinos Barmpas (Imperial College London), and Garrett Flynn (University of Southern California). During the spotlight, the last fifteen minutes of the session are dedicated to a panel discussion. Even though it is the occasion to enable further discussions on the presentations, it is also the occasion to answer specific questions asked by the speakers. Indeed, in the call for oral contributions, students propose general questions to be addressed (e.g. methods, tools, tips to improve their research skills, etc.).

In the summer, we hosted a two-part BCI science fiction event. This growing subcategory of science fiction merits further study, especially as the prominence of BCI increases in academia, medicine and industry. In addition to academic curiosity, science fiction influences public perceptions of science and its role in society. We often speak with lay-people whose views about BCIs are based on BCI-fi – often without realizing it. The two-part event hosted prominent speakers within the BCI-fi community to discuss their contributions to BCI-fi, their favourite examples of BCI-fi including movies, books, and podcasts, and next steps to develop, foster, or publicize “good” BCI-fi, namely Dr. Brendan Allison (UCSD), Andy Weir (author of *The Martian*), Dr. Eric Leuthardt (Washington University in St. Louis), Stephen Hou (host of *Neurratives* podcast), Dr. Richard Ramchurn (University of Nottingham), Dr. Jane Huggins (University of Michigan) and Dr. Robert Hampson (Wake Forest University).

## Journal Brain-Computer Interfaces



The Journal Brain-Computer Interfaces is there to publish your findings on all different aspects of BCI research. All BCI Society members have free access to the online edition of the International peer-reviewed journal Brain Computer Interfaces. In addition, if you choose to publish open access, BCI Society members get a 50% discount on open access article publishing charges.



# 10th International BCI Meeting

## June 6 – 9, 2023

### Sonian Forest, Brussels, Belgium

#### Workshop proposal

Opens: September 12, 2022

Closes: October 17, 2022

The BCI Society's board is pleased to announce a call for workshop proposals for the 2023 BCI Meeting.

Workshops are a defining feature of the BCI Meeting Series. BCI Meeting workshops have a distinctive emphasis on interaction and contribution from all members. They help to shape the field of BCI research, producing consensus and collaborations. There will be three 3-h workshop time slots, in which multiple workshops will run concurrently. Each workshop will engage 10-40 participants and focus on a specific topic.

Workshops can combine invited talks, targeted discussions, demonstrations, hands-on exercises and/or sharply focused debates as the leaders see fit. Workshop organization should include the participation of senior researchers to ensure proper coverage of the topic, should have speakers from different institutions and have at least 4 different organizing groups involved.

Visit <https://bcisociety.org/workshop-proposal/> for more information.



#### Oral and poster submission

Opens: November 7, 2022

Closes: January 23, 2023

Abstracts are accepted for poster submission. From those submissions, the Scientific Program Committee will select a limited number of abstracts for oral presentations.

Submissions are welcomed by anyone involved in BCI research. Student and post-doc contributions are particularly encouraged.

Visit <https://bcisociety.org/poster-and-oral-presentation-submission/> for more information.

