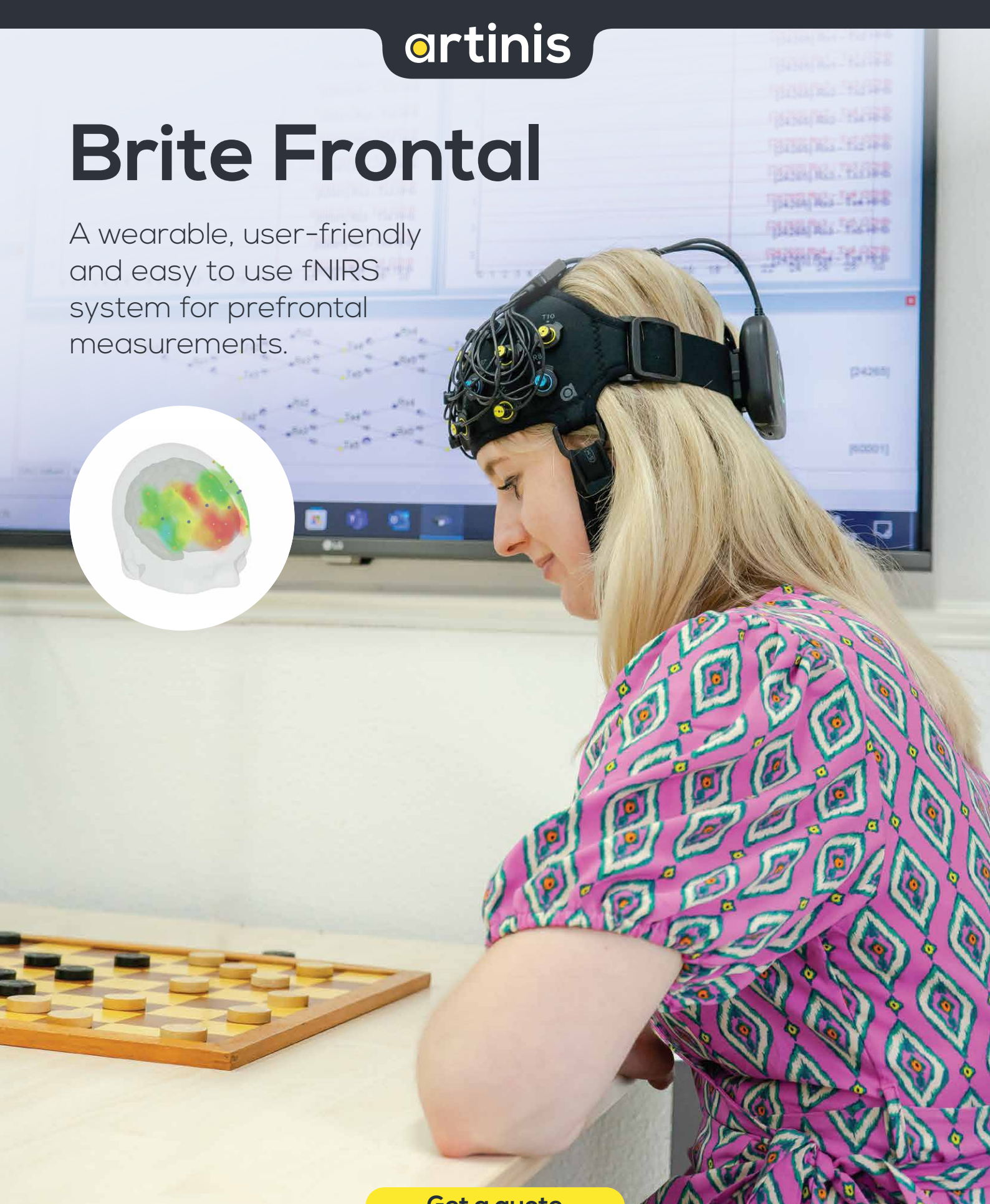
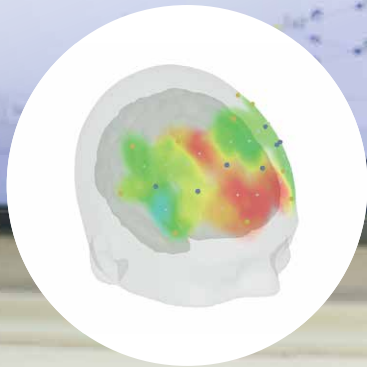


# Brite Frontal

A wearable, user-friendly and easy to use fNIRS system for prefrontal measurements.

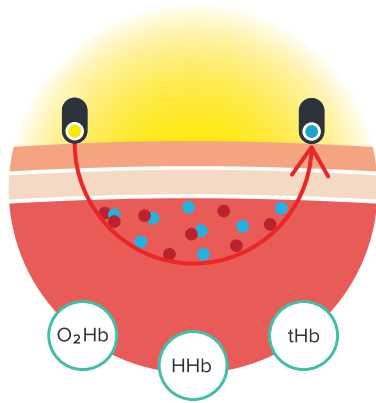


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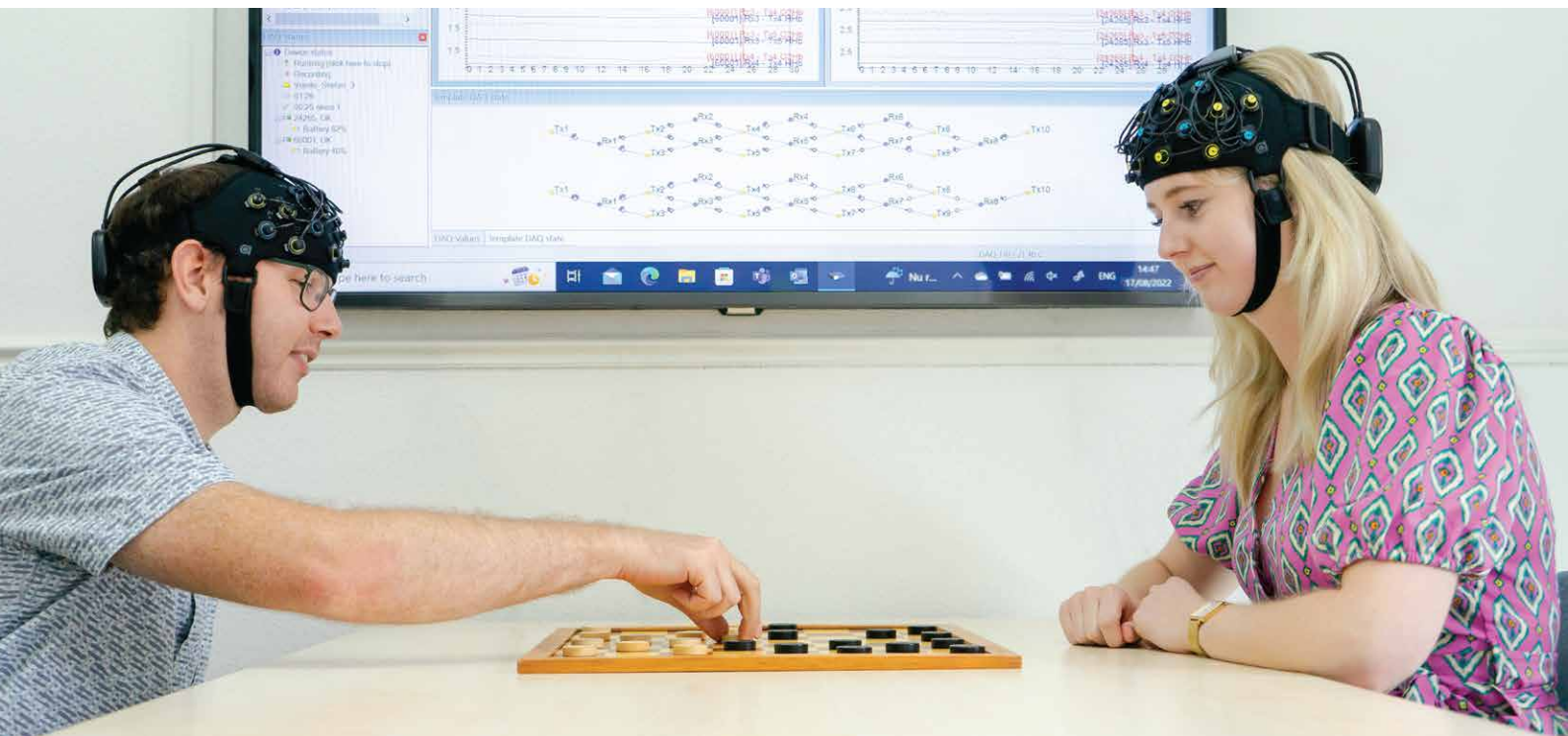
# Near Infrared Spectroscopy

Near Infrared Spectroscopy (NIRS), the technique which the Brite Frontal is based on, relies mainly on two characteristics of human tissue. The first is the relative transparency of human tissue for light in the NIR range. The second one is the oxygen-dependent absorbance of hemoglobin. Based on these principles, the Brite Frontal makes it is possible to monitor the prefrontal cortex activity of your subject:

- Non-invasively;
- Continuously, including recording and feedback;
- Affordably and without disposables needed;
- Wireless with almost no setup time;
- In easy setup and in any environment, both indoors or outdoors.

## WHAT CAN NIRS DO FOR ME?

- NIRS is used in many fields of research. NIRS measures the relative changes in the concentration of oxyhemoglobin (O<sub>2</sub>Hb), deoxyhemoglobin (HHb) and total hemoglobin (tHb) in biological tissue.
- Assuming the concentration of hemoglobin in blood is constant (during your measurement), the tHb can be used as a marker for blood volume.



## Frontal measuring at its BEST

### **B**oundless possibilities

Weighing only 300 grams and with almost no set-up time, the Brite Frontal enables studying the prefrontal cortex activation in almost every setting. The Brite Frontal can be used independently or combined with another Brite to perform hyperscanning.

### **E**asy to use

The headband of the Brite Frontal is quickly taken on and off and comfortable. This makes the device user-friendly and suitable for measuring with sensitive participants.

### **S**uitable for any setting

As the device is wireless and wearable, the Brite Frontal enables freedom for both researcher and research participant. It is also optimized with ambient light correction, making it possible to reliably measure prefrontal cortical activity in real-life settings.

### **T**op-notch data quality

The Brite Frontal offers improved data quality with a reduced system noise. Additionally, the dynamic range of the device has been improved, resulting in an increased system sensitivity.



Measures oxy-, deoxy-, and total hemoglobin concentration changes in the pre-frontal cortex.



Easy analysis of your data with our superior analysis software; OxySoft.



Truly wearable & flexible for a wide range of participants.



Multi-power gain control feature that allows to select the optimal light intensity settings for each channel and each participant.



## Applications

The Brite Frontal can be used to measure oxygenation in the prefrontal cortex. Due to its comfort and ease of use, participants are even able to perform physical activities like walking and cycling! This wearability makes monitoring prefrontal brain oxygenation of elderly, children and vulnerable patients comfortable and easy. The device is connected with a long-ranged Bluetooth antenna to the laptop and incorporated with an integrated movement sensor, making the Brite Frontal suitable for multiple research purposes, such as:

- Brain oxygenation monitoring
- Sports science
- Cognitive studies
- Psychological research
- Hyperscanning, and more

## Unexpectedly easy fNIRS hyperscanning setup

Hyperscanning is defined as simultaneously measuring the brain activity of multiple subjects. Social interactions are a crucial part of human life and understanding the neural underpinnings of it is a challenging task. Thus, measuring brain activity and interconnectivity in multiple participants at the same time gets increasingly important.

OxySoft, our NIRS monitoring software, allows connecting multiple devices simultaneously easily. Therefore, the data is perfectly synchronized and stored within one measurement file. This makes combining multiple Brite Frontal devices for hyperscanning purposes perfectly easy.



## 3D digitization & synchronization

Polhemus Viper and Patriot devices are well-known in the neuroscience world for precise digitization of sensor positions. In combination with the Brite Frontal, you can measure the exact location of the optodes on your participant's head within OxySoft.

With our OxySoft 3D extension you will benefit from a purely integrated solution, which guides you through the digitization process.

## What's in the box?

Brite Frontal package

Brite Frontal incl. neoprene headband  
OxySoft, data analysis software  
Laptop with pre-installed software  
License key & Bluetooth dongle

Universal micro-USB cable  
Battery charger  
User manual & quick start guide  
Support in setting up your research

# Technical specifications

TECHNOLOGY	Continuous wave Near-InfraRed Spectroscopy (NIRS) using the modified Beer-Lambert law
RELATIVE MEASURES	Oxy-, deoxy-, and total hemoglobin concentration changes
CHANNELS	24
TEMPLATE & LOCATION	Brite Frontal 24 channels
INTER-OPTODE DISTANCE	30 mm
TRANSMITTERS	10 LEDs, each with 2 wavelengths
RECEIVERS	8 photodiodes
WAVELENGTHS	Standard 760 and 850 nm, custom wavelengths possible
AMBIENT LIGHT CORRECTION	Proprietary algorithm to filter out ambient light
OPTODE HOLDERS	3 available heights to improve skin contact
DIMENSION	Control unit: 85x85x30 mm. Headbands available in size XS/S, M/L
TOTAL WEIGHT	305 grams including battery and headcap
ENVIRONMENT	Operating temperature: 10 - 35 °C
INDICATORS	Power, measuring, battery status, Bluetooth
POWER	Up to 3 h, charging with powerbank possible
SAMPLE RATE	Up to 75 Hz
ORIENTATION SENSOR	3-axis accelerometer and 3-axis gyroscope
DATA COLLECTION & STORAGE	Online, offline 100+ hours, automatic back-up of data
DATA ANALYSIS SOFTWARE	OxySoft: including 3D NIRS analysis software
OPERATING SYSTEM	Windows 10 and Windows 11 (beta)
EVENTS	Online, offline or PortaSync
ELECTROMAGNETIC COMPATIBILITY	No interference with TMS, EEG, EMG, ECG
HARDWARE SYNC OPTIONS	PortaSync, parallel cable, serial cable
SOFTWARE SYNC OPTIONS	LSL, DCOM (e.g. Matlab, E-prime, Presentation)

## References to wireless fNIRS

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## NIRS devices



### Brite

Our most advanced wearable & flexible fNIRS device to measure brain oxygenation from any cortical brain region, providing multiple optode outlays with up to 27 channels.



### PortaLite MKII

Truly *lite* & advanced oxygenation monitoring device that measures local tissue saturation index (TSI), as well as oxy-, deoxy- and total hemoglobin concentration changes.



### Brite Lite Frontal

Completely wireless 8-channel fNIRS device that is optimized for measuring prefrontal cortical activation in the brain.



### PortaMon

The gold-standard research device to monitor muscle activity which measures TSI, as well as oxy-, deoxy- & total hemoglobin.