

## Dear Z43 Partners, Friends, and Followers

*It's hard to believe that we are more than three quarters of the way through another busy year, winding down a very hot summer in Zurich with temperatures of over 36°C in our offices!*

*This issue of our newsletter summarizes the highlights of the past three months. We wish you a stimulating read and, as always, look forward to your feedback.*

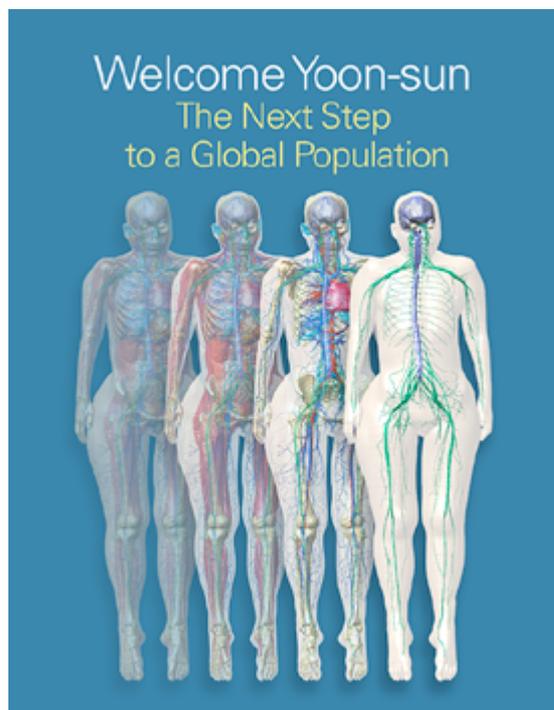
### MEASUREMENT

## Release of OH4VNA



Good news for all antenna designers: SPEAG's Optical Head for Vector Network Analyzers (OH4VNA) completely eliminates the uncertainty associated with testing electrically small antennas and devices at frequencies between 500 MHz – 6 GHz! Building on our proven optical time-domain sensor technology, we have developed the OH4VNA system as a fiber-optics port extension for use with any standard VNA. OH4VNA contains an absolute minimum ( $<0.2 \text{ cm}^3$ ) of metallic parts to bring the fiber-optics directly to the antenna feed port. The new OH4VNA combined with the latest features of our full-wave 3D EM simulation software SEMCAD X, makes antenna design validation easier than ever!

### VIRTUAL POPULATION

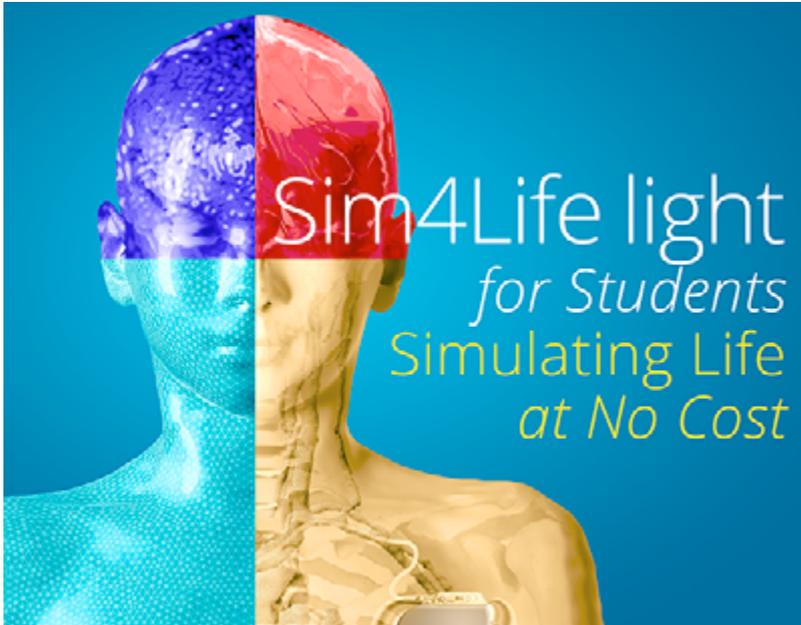


## New ViP Computational Phantom Yoon-sun

After 18 months of extensive work, IT'IS welcomes the second adult female computational model to its Virtual Population (ViP), the Korean phantom Yoon-sun cV3.1! The model is the successful result of the Swiss-Korean collaborative project NEUROMAN between IT'IS, Ajou University School of Medicine, Dongguk University College of Medicine, DYMSTEC, and HCTM. The release, an important extension of the existing European ViP towards better representation of the global population, has long been awaited by the medical implant community. It also heralds a new era of next-generation quality and resolution in segmentation ( $0.1 \times 0.1 \times 0.2 \text{ mm}$ ), manifested in detailed models of organs, vessel trees, peripheral nerves (from the cranium and spinal cord to internal organs and major muscles), and other small structures – from head to toe! The release will soon be followed by Yoon-sun V4.0, the first phantom with neuro-functionalized nerve trajectories modeled as splines and all major nerves, muscles, and blood vessels named, segmented, and meshed separately.

SIM4LIFE

## Sim4Life light: Explore the World of Complex Physiological Modelling and Simulations – for Free!



This is for you, students: ZMT is excited to introduce Sim4Life light, our powerful multi-physics simulation platform for supporting the study and research of undergraduate and graduate students – free-of-charge! Sim4Life light includes all of our physics solvers, tissue models, and many of the high-end modeling and analysis features of the original version, as well as the latest computational anatomical model Yoon-sun. The software is only marginally limited, as high-performance and cloud computing are not supported, and additional ViP models cannot be added. Yet, it is the first software freely available to introduce students to modeling with a state-of-the-art anatomical phantom and help them to learn how this technology can help solve highly complex multi-physics problems in science and engineering – for applications ranging from wireless communications to medical applications. [Download](#) it today!

WORKSHOP

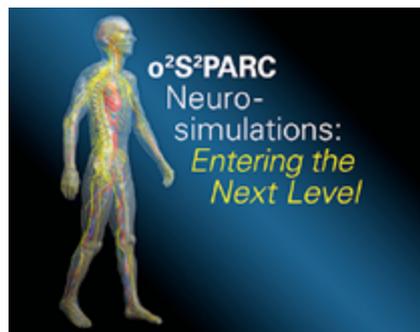
### IEC TC106 Meeting in Stockholm

Great progress on standardization was achieved at the joint meetings of IEC TC 106 and IEEE ICES TC34 held September 17 – 21, 2018 in Stockholm: the IEC is rapidly converging on international standards for measurement and computational assessment of exposure of devices that operate at frequencies >6 GHz, and a new dedicated working subgroup 9 started to work on procedures for wireless power transfer systems operating at frequencies of 30 MHz – 110 GHz. The joint group will meet next in Frankfurt in December 2018 to resolve the comments of the National Committees votes on IEC/IEEE 62209-1528 and IEC 62209-3 draft standards. If no technical changes are needed, publication of the two standards can be expected by mid-2019.



RESEARCH

### o<sup>2</sup>S<sup>2</sup>PARC Project Continues Full-Speed into Its Second Year



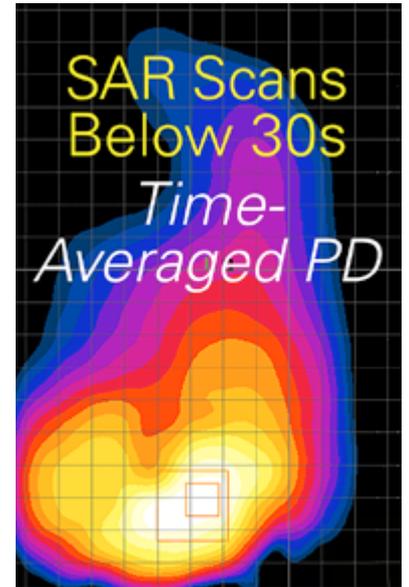
Already 12 months have passed since IT'IS announced the award from the NIH for the o<sup>2</sup>S<sup>2</sup>PARC project to develop an online framework capable of hosting and connecting simulations to create predictive, multi-scale, multi-physics models spanning from modulation sources acting at feasible access points to

organ functional responses. Since then, lots has happened. The most important result is the finding that our vision is technologically feasible. We have also been able to identify the technology best suited to help us achieve our ambitious goal of bringing these very complex simulations online. In year 2, we will continue with the implementation of the platform, with particular focus on the development of an intuitive graphical user interface to make the generation of computational anatomical models, integration of physiological models developed by our partners, and the execution of applied studies as user-friendly as possible. Another priority is the development, functionalization, and integration into the o<sup>2</sup>S<sup>2</sup>PARC platform of the NEUROCOUPLE and NEUROFAUNA anatomical models.

MEASUREMENT

## The Future of mmW Certification: cDASY6 Module mmWave V1.4, V2.0, V3.0, V4.0

SPEAG has defined the roadmap and product release schedule for tools to demonstrate compliance with current and upcoming safety standards (ICNIRP 1998, ICNIRP 2018, IEEE 2005, IEEE 2018) and measurement and numerical assessment standards (IEC JWG 11/12) of devices operating at frequencies >6 GHz. This includes improved and fast scanning, automated determination of maximum exposure configurations, determination of the total field in the entire space by forward propagation only by measurement on three planes, projections on phantom's surfaces, evaluation on device conformal surfaces, and demonstration of compliance with transmitted power density. All planned new features will be fully aligned with the updated FCC ruling presented at the TCB workshop last week. Any comments? What else can we provide to accelerate the rollout of your products? Please get in touch at [info@speag.swiss](mailto:info@speag.swiss) to provide us with your feedback!



SOCIAL EVENT

## Z43 Summer Party

With pleasure, Zurich43 hosted the annual Summer Night Party, Friday September 7. Grilled sausages and veggies, salads, cold beer, and gelato combined with perfect weather for a great party!



RESEARCH

## PUBLICATIONS

*Weiterführende Untersuchungen zur Dosimetrie einer tierexperimentellen Studie an Labornagern mit hochfrequenten elektromagnetischen Feldern*

**M. Murbach et al., 2018, report to the Bundesamt für Strahlenschutz (BfS), Vorhaben 3615S82433 (online 15 August 2018)**

*Systematic Derivation of Safety Limits for Time Varying 5G Radio-frequency Exposure Based on Analytical Models and Thermal Dose*

**E. Neufeld and N. Kuster, 2018, Health Physics (online 5 October 2018)**