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# Guest Editorial: Women in Emerging Organic and Hybrid Electronic Materials and Interfaces

*Luisa Petti,* Francesca Santoro, and Thuc-Quyen Nguyen*

The joint special issue "*Women in Emerging Organic and Hybrid Electronic Materials and Interfaces*" celebrates the scientific excellence, creativity, and leadership of women researchers advancing the frontiers of organic and hybrid electronics. Launched in honor of the International Day of Women and Girls in Science, this issue brings together original research and perspectives that exemplify the interdisciplinary rigor and innovation across materials science, physics, chemistry, and biology.

A prominent theme throughout this issue is the interface between organic electronics and biological systems. Gentile et al. (202500181) provide a perspective on multimodal, light-mediated organic bioelectronics. Campione et al. (202400776) investigate P3HT and P3HT-MWCNT composite films for neuronal interfacing, while Shakibania et al. (202400774) review strategies for covalent immobilization of biomolecules on electronic interfaces. Additionally, Boufidis et al. (202500261) demonstrate that electrochemically active $Ti_3C_2T_x$ MXene nanosheets are cytocompatible with cortical astrocytes, supporting their potential use in glial-targeted neural interfaces and bioelectronic applications. Extending this theme, Tommasini et al. (202400962) explore the dual functionality of thiophene-based semiconductors in Hydra vulgaris, where polymerization in soft tissues coincides with unexpected neuromodulatory behavior.

Diagnostics and environmental sensing are also strongly represented. Wheeler et al. (202400996) validate a supported lipid bilayer platform integrated with multielectrode arrays for detecting live bacteria. Miao et al. (202500033) demonstrate how membrane curvature influences the intercalation and remodeling behavior of conjugated oligoelectrolytes. Elli et al. (202400886) present an electrolyte-gated field-effect transistor sensor capable of detecting nanoplastics complexed with mercury ions, emphasizing pollutant detection in aquatic systems. Catacchio et al. (202500090) use a design of experiments approach to analyze signal amplification mechanisms in single-molecule wide-field biosensors, while Islayem et al. (202500303) introduce a modular microfluidic platform for multimodal analysis of biofilm formation and antimicrobial response.

Several contributions explore fundamental physical and chemical properties of emerging materials. Salamat et al. (202500098) investigate solvent swelling dynamics during electrochemical doping of P3HT with varying regioregularities. Harris et al. (202400779) study polaron dynamics in PM6 blends with fullerene and non-fullerene acceptors, shedding light on photoactive layer optimization. Miyazaki et al. (202400946) examine how meso-substituents and side chains influence packing and charge mobility in single-crystal organic field-effect transistors based on bisaryltetrabenzoporphyrins.

Advances in interface engineering and device fabrication are also featured. Saez et al. (202500097) fabricate PEDOT:PSS-based microstructured electrodes via vacuum soft lithography, achieving scalable and cytocompatible bioelectronic interfaces for in vitro cell culture. Ratcliff et al. (202500231) probe the buried NiOx/perovskite interface using spectroelectrochemical methods, showing that ionic liquid additives enhance energy alignment and photovoltaic performance in perovskite solar cells.

Device stability and sustainability receive dedicated attention. Hradilova et al. (202500412) demonstrate the long-term biocompatibility and operational stability of DNA-based organic mixed conductors in organic electrochemical transistors. Telschow et al. (202400956) evaluate sulfonium- and sulfoxonium-based interfacial modifiers to mitigate humidity-driven degradation in perovskite solar cells.

Innovations in modeling and nanofabrication expand the scope of next-generation device design. Suarato et al. (202400471) apply multiscale modeling to design a 3D soft magnetoelectric patch for wireless nerve stimulation—highlighting the role of simulation in neuromodulatory interface development. In nanophotonics, Raney et al. (202500037) introduce a deposition-controlled approach to engineer Mie-resonant metasurfaces using amorphous silicon. Cui et al. (202500187) show that single nanocrown electrodes enable high-fidelity intracellular recordings in cardiomyocytes, outperforming traditional multi-electrode setups. Shukla et al. (202500158) develop a dynamic spike sorting pipeline tailored for nanoelectrode array recordings, enabling efficient multiscale classification of neuronal signals.

Together, these diverse yet interconnected studies highlight the depth and breadth of interdisciplinary research in

L. Petti
Free University of Bolzano: Libera Universita di Bolzano
via Bruno Buozzi 1, Bolzano 39100, Italy
E-mail: luisa.petti@unibz.it
F. Santoro
RWTH Aachen: Rheinisch-Westfalische Technische Hochschule Aachen
Sommerfeldstrasse 18, Turm 24, 52074 Aachen, Germany
T.-Q. Nguyen
University of California Santa Barbara
Santa Barbara 93106, USA

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organic and hybrid electronic materials and interfaces. From molecular design and characterization to sensing, modeling, and system-level integration, the contributions in this issue address pressing challenges in healthcare, sustainability, and energy technologies.

Beyond showcasing scientific innovation, this issue aims to amplify the voices of women in science, increase their visibility, and inspire future generations. By highlighting contributions across disciplines and career stages, we hope to foster a more inclusive, dynamic, and equitable research community.

We are deeply grateful to all the authors, reviewers, and editorial teams who made this issue possible. We warmly invite readers to attend the upcoming webinar hosted by Advanced Electronic Materials and Advanced Materials Interfaces, where selected authors will present their work and discuss the future of organic and hybrid electronics.

## Conflict of Interest

The authors declare no conflict of interest.