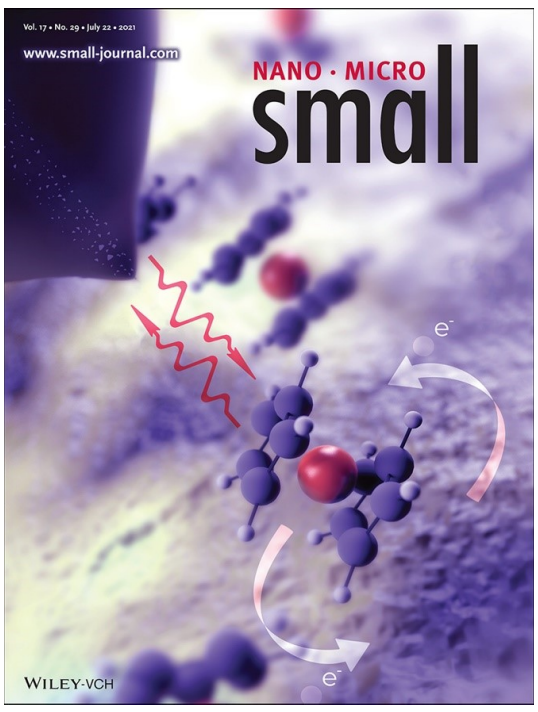
Click here to visit the Webversion

NEWSLETTER ISSUE 3

Welcome…

…. to the 3rd issue of our NanoBat newsletter. We are excited about having quite some papers published in scientific journals in the past few weeks. You will find all the references in this newsletter. So, dive into them to find out more about our work!
We also invite you to meet Dr. Marzena Olszewska-Placha who has been a Research Engineer at QWED since 2010 and is involved in electrical material characterisation and multiphysics modelling in NanoBat.

A journey through the latest NanoBat scientific publications



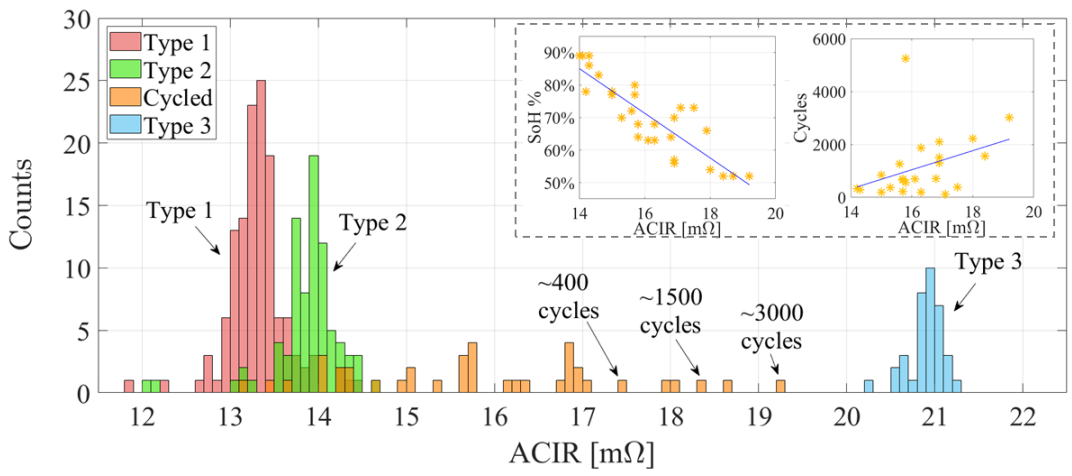
Attoampere Nanoelectrochemistry

High frequency (GHz) signals are sent to a scanning tunnelling microscope probe down to the surface of an alkylferrocene self-assembled monolayer in liquid and allow to measure locally electrochemical charge transfer corresponding to currents on the order of attoampere. This technique, presented in article number 2101253 by Nicolas Clément, Georg Gramse, and co-workers, opens the way to unprecedented precision for local measurements in biology, electrochemistry, and materials science.

The publication is available here.

Multiplexed 16x16 Li-ion Cell Measurements Including Internal Resistance for Quality Inspection and Classification

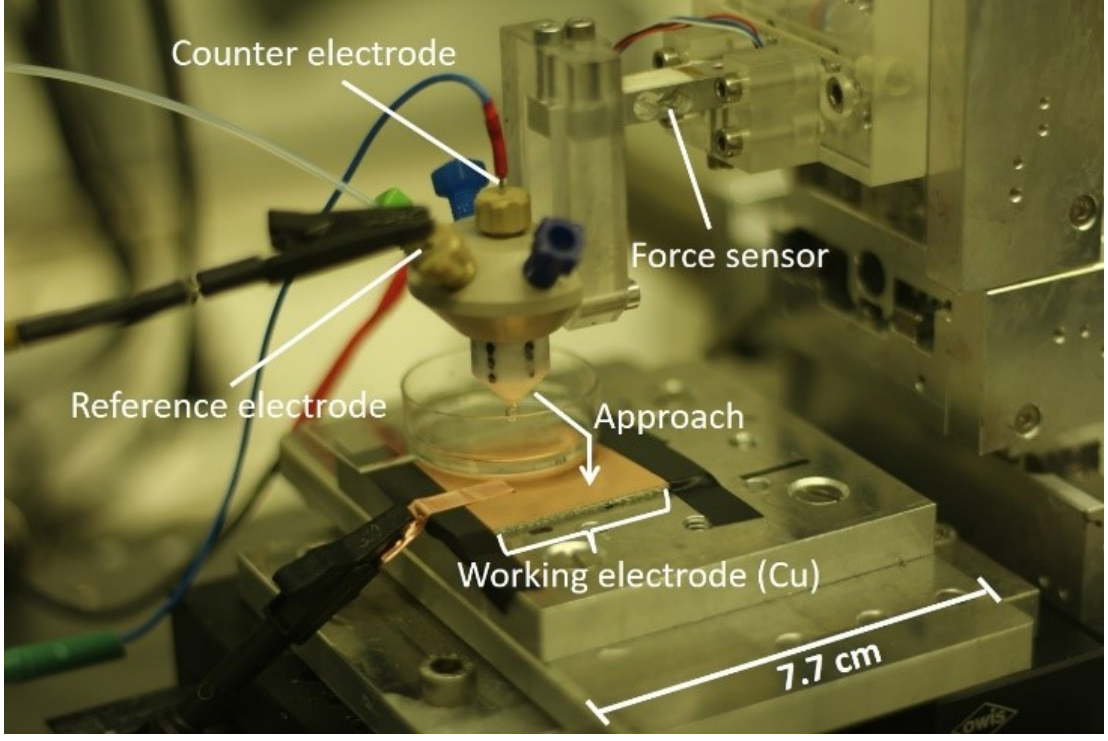
Characterization and classification of lithium-ion batteries (LIB) are of high relevance for cell and battery producers, especially with the rising demands on LIBs for electric vehicle applications. The work presents a compact measurement station with 256 multiplexed channels to measure the open circuit voltage (OCV) and the alternating current internal resistance (ACIR) of a tray of 256 cylindrical cells. Four different cell types are distinguished based on the ACIR values, showing the ability of detecting minor differences between cells. Moreover, several calibration workflows are applied, and the state of health (SoH) of cycled cells is computed and correlated to the ACIR.



The pubilcation is availabe here.

Accelerated Electrochemical Investigation of Li Plating Efficiency as Key Parameter for Li Metal Batteries Utilizing a Scanning Droplet Cell

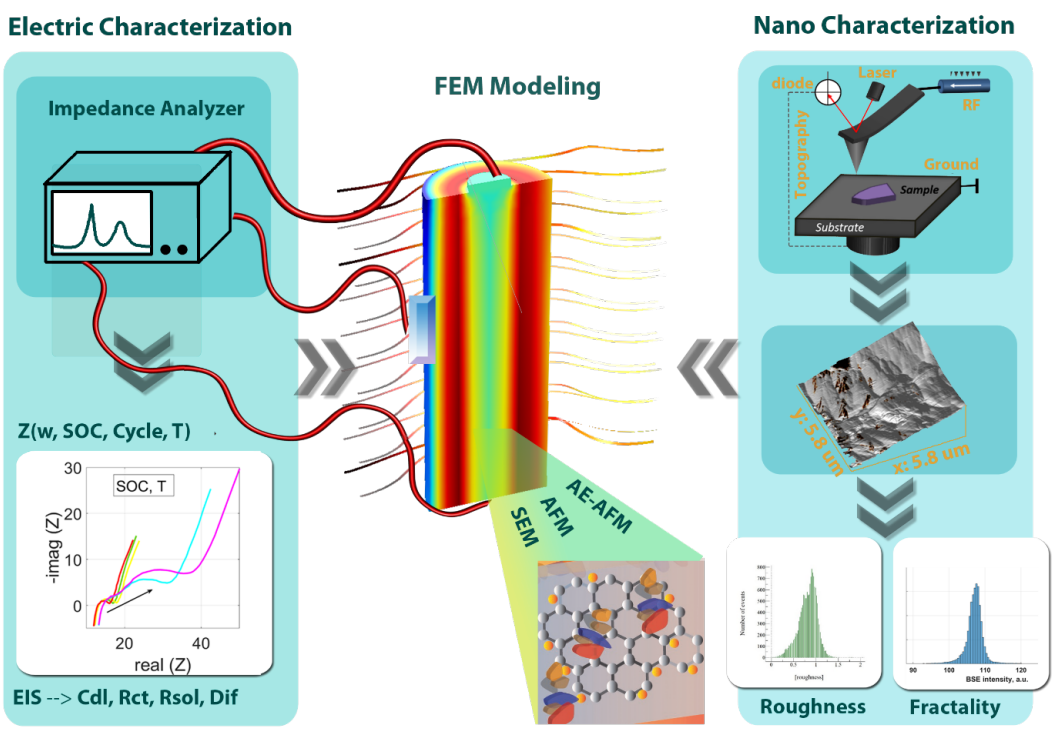
The scanning droplet cell (SDC) allows for automatized electrochemical experiments leading to time-saving and reproducible experimental conditions. In this work, its implementation for non-aqueous battery research is discussed, and the necessary adaptations to be operated inside an Ar-filled glovebox in complete absence of oxygen and moisture are described investigating the plating/striping processes for Li metal electrode as case study.



The pubilcation is availabe here.

Assessment of Lithium-Ion Battery Ageing by Combined Impedance Spectroscopy, Functional Microscopy and Finite Element Modelling

In this work we show how EIS complemented by microscopy data can be successfully used to follow battery ageing. The data from both methods are connected by an electrochemical finite element model (FEM) to extract changes of intrinsic battery parameters. The approach allows for unambiguous extraction of ageing related parameters. Ageing mechanisms induced by cycling and temperature are investigated by EIS on commercial cells and post-mortem analysis of anode and cathode electrodes is carried out to determine their initial micrometric and nanometric structure and to independently investigate morphological and electrical changes induced by ageing. Microscopy reveals conductive subsurface features related with electrode degradation.



The pubilcation is availabe here.

Meet the people behind NanoBat - Dr. Marzena Olszewska-Plancha

Dr. Marzena Olszewska-Placha has been a Research Engineer at QWED since 2010 and is involved in NanoBat as a researcher in electrical material characterisation and multiphysics modelling. During her studies she gained specific experience in the design of waveguide filters, double reflector antennas, and graphene-based composite absorbing panels. At QWED, she has been involved in several R&D and commercial projects (such as the H20202 MMAMA and M.ERA-NET ULTCC6G_EPac), concerned with electromagnetic and multiphysics modelling and design of various microwave components, as well as with the electromagnetic characterisation of materials, including dielectric substrates and conducting films. She is author of 11 journal articles and 27 conference presentations with over 200 citations, 3 book chapters, and one patent (on electromagnetic absorbing panel based on graphene-based composites).

Marzena is also active in professional non-profit associations, including the European Materials Modelling Council (where she is co-chairing the Interoperability Focus Area) and IEEE (where she is Secretary and Treasurer of the IEEE Poland Section Women in Engineering AG).

Marzena’s career path is distinctive in that it successfully combines research, engineering, and management. In recognition of her outstanding contributions to QWED’s research coordination (and the research itself!), in June 2021 she was elected Vice-President of QWED’s Board, serving as Director for Research and Development.

See Marzena's track record here.

Pilot line services available now!

Our partner Pleione Energy has established an end-to-end pilot line for the development of electrochemical energy storage devices (batteries, supercapacitors etc.), where all the critical manufacturing parameters are carefully controlled and optimized.

Further information and Pleione contact details are availalbe on our website!

Upcoming Events

IBPC 2021 - International Battery Production Conference
November 1-3, 2021, hybrid conference (Braunschweig, Germany & online)

The International Battery Production Conference 2021 is organized by NanoBat partner TUBS.
Keysight will give two presentations, one on Electrochemical Impedance Spectroscopy (EIS) and the other one on Software Architecture for Battery Cell Manufacturing.

More information on the conference can be found here!

2021 IEEE AP-S
December 4-10, 2021, Marina Bay Sands, Singapore

QWED will give a presentation on bridging the traceability gap in the characterisation of dielectric materials used in 5G applications

More information on the conference can be found here!

We hope that you enjoyed the 3rd issue of our newsletter and look forward to continuing our exciting journey with you.

Connect with us:

Facebook **Homepage**

Contact **Privacy Policy**

The NanoBat project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 861962.

Legal Notice:
Eurice GmbH
Heinrich-Hertz-Allee 1
66386 St. Ingbert