BATTERY 2030+

**Newsletter**
**March, 2022**

**The vision** for BATTERY 2030+ is to invent the batteries of the future, providing European industry with disruptive technologies and a competitive edge across the full value chain, that will enable Europe to take the lead in battery science and technology.

**This newsletter** gives you an update on what's going on within the initiative.
Enjoy your reading!

# A moment with Eva Regårdh,

## Project lead of BATTERY 2030+

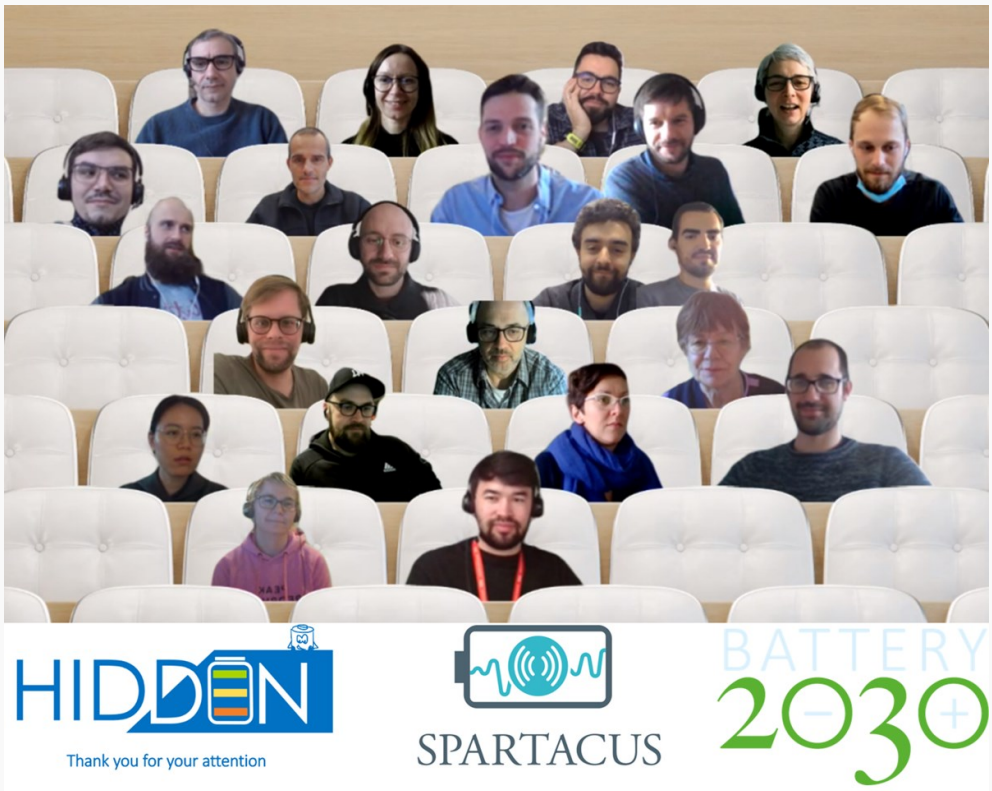
So many things are currently going on in the Battery 2030+community! Midterm reviews are coming up for all research projects as well as for us in the CSA (Communication and Support Action). It requires lots of preparation and is a good opportunity to gather and reflect over the work and scientific progress being done. We have also updated the roadmap for Battery 2030+ with short, medium and long-term visions. Moreover, other reports to the Commission are in the pipe-line.

Educational activities are also on the run. Recently a “Zeroing course” was given by Sensibat and the Battery 2030+ cluster. A special thank to moderator and organizer Silvia Bodoardo, Polito, Iñigo Gandiaga, Ikerlan and Juergen Garche from Varta. It was a popular initiative that attracted many of us eager to learn more about ageing processes, their modelling and how you can measure battery states with sensors.

On March 8th we celebrated women in science with a Battery 2030+ Excellence seminar given by Sandrine Lyonnard, CEA, on the topic “Accelerating battery characterisation using neutron & synchrotron techniques: why and how”. On the same day we presented a number of excellent female researchers on our web.

The research in our scientific projects is flourishing and success stories are now dropping in. New curricula build skills just like the impact from our research projects in time will support a strong European industry. In light of the pandemic

we have had many workshops and meetings on-line, but now we really look forward to meet in person again. Hope to see you!




## Combining self-healing and sensing – battery technology workshop

**HIDDEN-SPARTACUS joint workshop on Feb 8th, 2022**

An interesting workshop between Spartacus and Hidden project took place on February 8th, under the umbrella of the Battery 2030+ initiative with the aim to seek complementary competences, project synergies and potential technology sharing. Topics discussed were about sensor questions (e.g. how could Spartacus battery sensors provide more information to the Hidden approach to intrinsic self-healing battery electrodes?) as well as self-healing and dendrite growth questions (e.g. How could the Hidden self-healing help reaching the Spartacus sensing and battery management goals - charge faster, last longer?). All participants agreed that the two projects can enhance their impact by building on this bilateral collaboration, hence, more discussions will follow to exploit all synergies.

*Melinda Kuthy and Marie-Luise Righi*


# Better batteries – Sensing signals pave the way

***To meet climate commitments we need batteries to perform better and tailor them to meet specific requirements, be it industry, transport, or buildings. With INSTABAT's smart sensing technology new horizons open up to improve battery cell use and performance by reducing ageing, allowing decrease of safety margins, triggering self-healing and facilitating second life.***

The Instabat project, one of six research projects within Battery 2030+, intends to monitor operando key parameters of a Li-battery cell. If you know what happens in the battery during operation you can improve the safety and quality, reliability and lifetime of the battery.

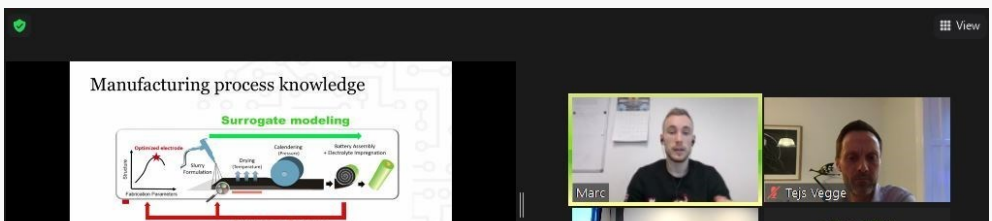
"We develop proof of concept of smart sensing technologies, integrate them in the battery cell to check key parameters like temperature, heat flow, pressure, impedance, and potential", says Olivier Raccurt project leader for Instabat.

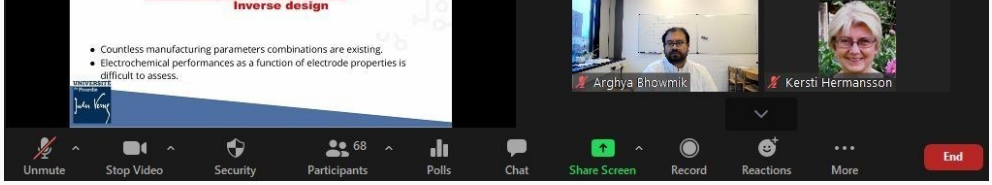
To do this embedded physical sensors are correlated to virtual ones. Instabat uses optical fibres (Bragg grating), luminescence probes, reference electrodes, and photo-acoustic gas sensors. They monitor the battery in operando and keep track of temperature and heat flow, pressure, strain, Li+ concentration and distribution, $CO_2$ concentration; "absolute" impedance, potential and polarization. The evolution of these parameters is checked in relation to the degradation taking place at the heart of the battery cell. This is done by opening and perform a post-morten analyse of the cell where the degradation inside the cell is correlated to the sensors signature. The virtual sensors, one based on an electro-chemical model and one on a thermal one, are developed to improve the real time cell monitoring. Virtual and physical sensors are implemented in cells and connected to the BMS to improve the SOx indicators (State Of Charge, State of Health, State of Power, etc...)

The results and knowledge achieved builds a proof of concept multi-sensor platform providing cell indicators of state of health and safety in real-time, used to improve cell functional performance and safety. Right now Instabat focus on cycling at extreme conditions and high-power charging for Electric Vehicles (EV) applications. Manufacturability and adaptability to other cell technologies are also high on the agenda.

"We are well under way to develop a new sensor technology for battery monitoring and their integration into cells and data acquisition and management. Sensors and their integration processes have a strong commercial potential. They represent promising future tools for the battery industry, and on a shorter term also for other projects within Battery 2030+", concludes Oliver Raccurt.

*Eva Regårdh*



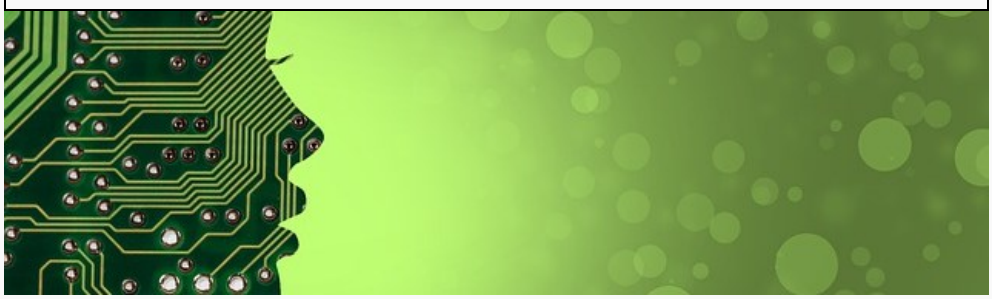



# AI WORKSHOP

"We aim to continually train the Big-Map and Battery 2030+ members in effectively using and integrating AI models developed from these projects in their research practice" says Arghya Bhowmik the main organiser of the first AI workshop where young researchers involved in AI development will train others through lectures and hands on tutorials.

The 1st workshop (January 2022 edition) was conducted fully online over the two days of 24th and 25th January 2022. In the morning, there was three oral presentations in a single track attended by all, and after lunch, three parallel hands on session were executed by respective oral presenters and additional tutors. In the afternoon people were divided into three groups to learn how to use one tool in-depth. Each oral presentation was a 30-40 min lecture followed by a discussion totalling 60 min.

Among researchers affiliated with Battery 2030+ projects (Bat4Ever, Big-Map, Hidden, Sensibat, Spartacus) 114 members attended the workshop covering all seniority levels from graduate students to senior professors.The researchers, PhDs, and postdocs performed the teaching and training while professors played the role of moderators and teaching assistants. The teaching materials, software repo and workshop discussions were preserved for continued learning through slack channels and Big-Map github. Live reporting from the workshop created good engagement through Twitter feeds.



## BATTERY 2030+ celebrated women in science on March 8th

Read about these fantastic women **here...**

## Do not miss out...

## YOUNG SCIENTIST EVENT June 1st

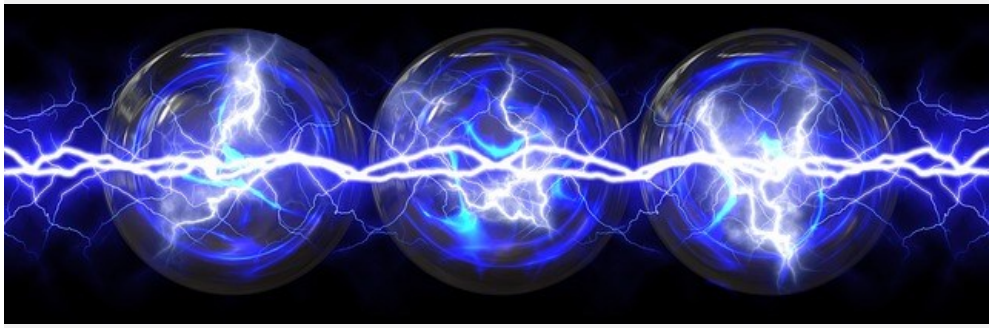
The event is organised for young scientists and will be held at 4 Universities in Europe defined by their geographic position (e.g. POLITO Politecnico di Torino, UU Uppsala University, VUB Vrije Universiteit Brussels, WUT Warsaw University of Technology). All universities will be connected via a live web connection to allow open discussion. Together the new generation of scientists will share new innovative ideas and collaborate on future research efforts.

The young scientists of different expertise will sit around tables to discuss the future outlook of the European battery research and expectations. The goal is to produce a Manifesto for batteries of the future by the new generation of scientists in Europe.

Read more **here...**

### BATTERY 2030+ Excellence Seminars

Did you miss any of our Excellence seminars? Not to worry, we posted them on our website with subtitles for you to enjoy.
Watch them **here...**



## Save the date for our BATTERY 2030+ annual meeting in Brussels, September 12th!

## BATTERY 2030+ Excellence Seminar

"Digitalization of Battery Manufacturing Processes: Why and How?"

Guest speaker, Prof. Alejandro A. Franco

April 5th, Sign up **here...**

## Did you miss the Zeroing course on Li-ion batteries?

Watch it **here...**


## Read our latest news

**Keep up** to date with the latest news from BATTERY 2030+ and other battery related topics. **Read more...**