

# WE ARE SPARTACUS

- 4 research organizations
- 1 university
- 2 industrials

Covering relevant expertise from materials and battery knowledge to battery pilot production, sensor development with various approaches and impedance analysis to the implementation of management systems.

BATTERY  
2030+

The European Union is funding SPARTACUS as part of the BATTERY 2030+ research initiative.



# WE'RE READY WHEN YOU ARE

## Contact

Gerhard Domann (Coordinator)  
Phone +49 931 4100 551

Dr. Jochen Settelein  
Phone +49 931 4100 916

[www.spartacus-battery.eu](http://www.spartacus-battery.eu)  
[spartacus-main@isc.fraunhofer.de](mailto:spartacus-main@isc.fraunhofer.de)



**SP**ATIally Resolved acou**ST**ic,  
mech**AN**iCal and **UL**tra**S**onic  
sensing for smart batteries



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 957221.

# SPARTACUS

## MISSION

Faster charging, longer stability of performance not only for electric vehicles but also for other battery powered products – that's what SPARTACUS research project wants to achieve.

The project focuses on mechanical and acoustic sensors complemented by temperature sensors and electrochemical impedance spectroscopy. The sensor data will feed an advanced battery management system, which compares real data with battery data models to gain a comprehensive analysis of the real battery condition.

## VISION

- Reduce charging times by up to 20 % without compromising the reliability and service life of batteries by utilizing advanced sensors and cell management systems.
- Optimize detection of battery health and battery function to recharge in a safe but fast way.
- A safer and more ecological and economical operation of batteries.
- A deeper understanding of the processes in the battery.
- Integrated sensor technology, data acquisition and processing contributes to "big data" approaches and provides interfaces for the use of artificial intelligence.

## KEY APPLICATION AREAS

- Electric mobility (auto, e-bus)
- Industrial applications
- Portable electronic devices
- Others (medical devices, power tools, gardening tools, e-bikes, etc.)

## OBJECTIVES

1. Development of new sensors design for smart batteries.
2. Integration of the sensors according to industrial constraints.
3. Data acquisition and data pre-processing for BMS integration.
4. Modeling of failure mechanisms and correlation with SoX.
5. Development of an advanced BMS and standardization procedures.
6. Economic and environmental assessment.

