

# Christian Prehal

## PERSONAL DATA

Date of birth 14 March 1988  
Address Freiestrasse 198, 8032 Zurich,  
Switzerland  
Nationality Austrian  
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Languages German (mother tongue), English  
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## EDUCATION

21/04/2014 – 15/09/2017 Institute of Physics, Montanuniversität Leoben  
Ph.D. (Dr.mont.) in Materials Physics and Electrochemistry, *with distinction*  
Thesis: *Ion electrosorption in nanoporous carbons*  
01/10/2008 – 31/03/2014 Institute of Physics, Montanuniversität Leoben  
Master (Dipl.-Ing.) in Materials Science and Engineering, *with distinction*  
Thesis: *In-situ SAXS study on the ion dynamics in microporous carbon based supercapacitors*  
07/01/2012 – 30/07/2012 NTNU Trondheim, Norway  
Study abroad in Materials Science and Engineering

## PROFESSIONAL EXPERIENCE

01/05/2020 - current Postdoctoral Researcher (since 02/2022: Senior Assistant)  
Materials and Device Engineering Group (Vanessa Wood)  
Institute for Electronics  
Department of Information Technology and Electrical Engineering  
ETH Zürich  
09/01/2018 – 30/04/2020 Postdoctoral Researcher  
Freunberger Group (Stefan Freunberger)  
Institute for Chemistry and Technology of Materials  
Graz University of Technology  
16/09/2017 – 31/12/2017 Postdoctoral Researcher  
Nanomaterials & Scattering group (Oskar Paris)  
Institute of Physics, Montanuniversität Leoben  
21/04/2014 – 15/09/2017 Project Assistant / PhD Student  
Nanomaterials & Scattering group (Oskar Paris)  
Institute of Physics, Montanuniversität Leoben  
01/05/2013 – 31/03/2014 Master Student Researcher  
Nanomaterials & Scattering group (Oskar Paris)  
Institute of Physics, Montanuniversität Leoben  
01/10/2011 – 30/04/2013 Research Assistant  
Nanomaterials & Scattering group (Oskar Paris)  
Institute of Physics, Montanuniversität Leoben  
04/07/2011 – 31/08/2011 Research Assistant  
Scanning Probe Microscopy group (Christian Teichert)  
Institute of Physics, Montanuniversität Leoben

## AWARDS & HONOURS

04/11/2022	ERC Starting Grant
01/12/2021	ETH Zürich Career Seed Grant
01/02/2020	Marie Skłodowska-Curie actions, Individual Fellowship
05/12/2017	Fonda-Fasella Award for extraordinary experiments and results of young researchers at the Synchrotron radiation source ELETTRA or FERMI, Trieste, Italy
04/12/2017	Christian-Doppler-Preis of Bundesland Salzburg in the branch „Anwendung des Doppler-Prinzips, technische Wissenschaften, Informatik, Mathematik und Physik“
07/12/2017	Award of Excellence of the Austrian ministry for science (BMWFW) for best dissertations in the year 2016/2017
2016 & 2018	Scholarship recipient of European Forum Alpbach (EFA) 2016 and 2018
25/09/2014	OEPG Student Prize of the Austrian Physical Society for the best master thesis in the field of experimental physics Austrian Physical Society
31/03/2014	Rektor-Platzer-Ring for extraordinary study accomplishments Montanuniversität Leoben
2009 - 2017	Performance Scholarships & Student Research Awards Montanuniversität Leoben 2009, 2011, 2013, 2014, 2017

## KEY FIGURES

22 papers	in peer-reviewed journals
h-index	13 (source: google scholar, 04.12..2022)
citations	908 (source: google scholar, 04.12.2022)
talks & presentations	10 invited talks, 18 contributed talks, 7 poster presentations

## RESEARCH PROJECTS

- From 2023; ERC Starting Grant  
Systems Materials Engineering for High-Rate Bulk Solid-State Conversion in Metal-Sulfur Batteries (SOLIDCON); Principal Investigator (PI)
- 2022 – 2025; M-ERA.net, transnational consortium  
Advanced Lithium-sulfur batteries with ultramicroporous carbons (ALISA)  
Co-principal investigator (Co-PI) at ETHZ, supervision of 1 PhD student over a 3 years period
- 2022 – 2023; ETH Zürich Career Seed Grant  
Bulk solid-state sulfur to lithium sulfide conversion in lithium-sulfur batteries  
Principal investigator (PI), ETHZ funding to support independency of young researchers
- 2020 – 2022; Horizon 2020, Marie Skłodowska-Curie actions, Individual Fellowship,  
Nanoscale phase evolution in lithium sulfur batteries (NanoEvolution),  
Principal investigator (PI), supervision of 1 Master student and 4 PhD students over a 2 years period
- 2018 – 2020; European research Council, ERC Starting Independent Researcher Grant,  
Organic mixed ion and electron conductors for high-energy batteries,  
(PI Freunberger), employed as postdoc, mentored 1 PhD student over a 1 year period
- 2015 – 2017; Austrian Research Promotion Agency (FFG), Klima- & Energiefond,  
Hybride Superkondensatoren durch innovative Materialkonzepte,  
(PI Paris), employed as PhD student, contributed to securing funding

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2014 – 2015; Austrian Research Promotion Agency (FFG), COMET K2 MPPE,  
In-situ SAXS/GISAXS of solid-gas interactions in nanoporous materials and at nanostructured surfaces,  
(PI Paris), employed as PhD student

## MAJOR ACADEMIC COLLABORATIONS

Prof. Stefan Freunberger	Electrochemistry, IST Austria (Institute of Science and Technology Austria)
Prof. Oskar Paris	Small angle scattering, Montanuniversität Leoben, Austria
Prof. Volker Presser	Energy Materials, INM Saarbrücken, Germany
Prof. Heinz Amenitsch	Small angle scattering, Synchrotron ELETTRA, Italy
Dr. Alen Vizintin	Li-S batteries, National Institute of Chemistry, Ljubljana, Slovenia
Dr. Lionel Porcar	Neutron scattering, ILL Grenoble, France

## PROFESSIONAL ACTIVITIES IN INDUSTRIAL COMPANIES

11/2019 – 01/2021	Anton Paar GmbH Development of operando SAXS/WAXS battery cell Graz, Austria
07/2012 – 09/2012	Airbus SAS, Research & Development, Failure Analysis, Bremen, Germany
07/2010 – 09/2010	Treibacher Industrie AG Research & Development, Colloidal chemistry and oxide ceramics Althofen, Austria

## TEACHING EXPERIENCE

2021 – 2022	Lecturer for the ETH Zürich CAS (Certificate of Advanced Studies) course <i>Applied Technology in Energy</i> , module <i>Energy Storage</i> , as a part of the Master of Advanced studies (MAS): <a href="https://mas-at.ethz.ch">https://mas-at.ethz.ch</a> Conceptualization, preparation and presentation of course material; Preparation and grading of online exam; Institute for Electronics, ETH Zürich
2021 – 2022	Guest-Lecturer <i>Chemistry of Devices and Technologies</i> Preparation and presentation of Reverse engineering lab on Li-ion batteries Institute for Electronics, ETH Zürich
10/2014 – 12/2017	Lecturer <i>Physics I &amp; Physics II Exercises</i> (summer and winter semester) Preparation and presentation of course material, correction of exams Institute of Physics, Montanuniversität Leoben
10/2011 – 04/2013	Teaching Assistant <i>Physics I &amp; Physics II laboratory courses</i> Tutoring and Mentorship during experiments and data editing Institute of Physics, Montanuniversität Leoben

## MENTORSHIP, (Co-)SUPERVISION<sup>1</sup>

1 Bachelor student	Supercapacitors (MU Leoben)
3 Master students	Li-S batteries (ETH Zürich)
6 Ph.D. students	Supercapacitors (MU Leoben) Li-O <sub>2</sub> batteries (TU Graz), Li-S and Li-ion batteries (ETH Zürich), Cryo-EM, Scattering, Modeling, Li-S batteries (ETH Zürich) Tomography and solid-state batteries (ETH Zürich) Scattering on Fuel Cell catalyst layers (PSI, Villigen)

## ADDITIONAL SKILLS RELEVANT FOR TEACHING

Didactics seminar I & II	Enrique Grabl, MU Leoben 2014 & TU Graz 2019
Rhetorical skills seminar	Daniela Ettl, TU Graz 2019

## REVIEWING ACTIVITIES

Nature Communications, ACS Nano, Journal of Applied Crystallography, Energy Storage Materials, Advanced Energy Materials, Journal of Materials Chemistry A, Journal of Surface and Coatings Technology, Carbon, Materials Characterization, National Science Centre Poland

## MEMBERSHIPS

Austrian Physical Society (ÖPG), International Society of Electrochemistry (ISE)

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<sup>1</sup> Refers to mentorship on a regular basis; official supervision is only allowed as professor;

## 9 MOST IMPORTANT SCIENTIFIC PUBLICATIONS

C. Prehal\*, J.M. von Mentlen, S. D. Talian, A. Vizintin, R. Dominko, H. Amenitsch, L. Porcar, S. A. Freunberger\*, V. Wood\*, On the nanoscale structural evolution of solid discharge products in Lithium-Sulfur batteries using operando scattering, **Nature Communications** 2022, 13, 6326

C. Prehal\*, S. Mondal, L. Lovicar, S. A. Freunberger\*, Exclusive solution discharge in Li-O<sub>2</sub> batteries? **ACS Energy Letters** 2022, 7, 9, 3112–3119

C. Prehal\*, A. Samojlov, M. Nachtnebel, L. Lovicar, M. Kriechbaum, H. Amenitsch, S. A. Freunberger\*, In situ small angle X-ray scattering reveals solution phase discharge of Li-O<sub>2</sub> batteries with weakly solvating electrolytes, **PNAS** 2021, 118 (14), e2021893118

C. Prehal\*, H. Fitzek, G. Kothleitner, V. Presser, B. Gollas, S. A. Freunberger\*, Q. Abbas\*, *Persistent and Reversible Solid Iodine Electrodeposition in Nanoporous Carbons*, **Nature Communications** 2020, 11, 4838

C. Prehal\*, S. Grätz, B. Krüner, M. Thommes, L. Borchardt, V. Presser, O. Paris\*, *Comparing pore structure models in nanoporous carbons obtained from small angle X-ray scattering and gas adsorption*, **Carbon** 2019, 152, 416

C. Prehal\*, C. Koczwar, H. Amenitsch, V. Presser, O. Paris\*, *Salt concentration and charging velocity determine ion charge storage mechanism in nanoporous supercapacitors*, **Nature Communications** 2018, 9(1) 4145.

C. Prehal, C. Koczwar, N. Jäckel, H. Amenitsch, V. Presser\* and O. Paris\*, *A carbon nanopore model to quantify structure and kinetics of ion electrosorption with in situ small-angle X-ray scattering*, **Physical Chemistry Chemical Physics**, 2017, 19, 15549.

C. Prehal, C. Koczwar, N. Jäckel, A. Schreiber, M. Burian, H. Amenitsch, M. A. Hartmann, V. Presser\*, O. Paris\*, *Quantification of ion confinement and desolvation in nanoporous carbon supercapacitors with modelling and in situ X-ray scattering*, **Nature Energy**, 2017, 2, 16215.

C. Prehal, D. Weingarth, E. Perre, R.T. Lechner, H. Amenitsch, O. Paris\* and V. Presser\*, *Tracking the structural arrangement of ions in carbon supercapacitor nanopores using in situ small-angle X-ray scattering*, **Energy & Environmental Science**, 2015, 8, 1725-1735. Selected as "Hot Article".

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\* corresponding author

## OTHER PUBLICATIONS IN PEER-REVIEWED JOURNALS

- Y. Zhang, C. Prehal, H. Jiang, Y. Liu, G. Feng\*, V. Presser\*, Ionophobicity of carbon sub-nanometer pores enables efficient desalination at high salinity, **Cell Reports – Physical Science**, 2022, 3 (1), 100689.
- Y. Petit, E. Mourad, C. Prehal, C. Leypold, A. Windischbacher, D. Mijailovic, C. Slugovc, S. Borisov, E. Zojer, S. Brutti, O. Fontaine, S. A. Freunberger\*, *Mechanism of mediated alkali peroxide oxidation reveals strategies to suppress singlet oxygen formation*, **Nature Chemistry** 2021, 13, 465.
- J. Schoiber, C. Koczwar, S. Rumswinkel, L. Whitmore, C. Prehal, F. Putz, M. S. Elsaesser, O. Paris, N. Hüsing, *A Facile One-Pot Synthesis of Hierarchically Organized Carbon/TiO<sub>2</sub> Monoliths with Ordered Mesopores*, **ChemPlusChem** 2021, 86 (2), 275.
- A. Varzi\*, K. Thanner, R. Scipioni, D. D. Lecce, J. Hassoun, S. Dörfler, H. Altheus, S. Kaskel, C. Prehal, S. A. Freunberger, *Current status and future perspectives of Lithium metal batteries*, **Journal of Power Sources** 2020, 480 (12), 228803.
- M. A. Hobisch, J. Phiri, J. Dou, P. Gane, T. Vuorinen, W. Bauer, C. Prehal, T. Maloney,\* and S. Spirk\*, *Willow Bark for Sustainable Energy Storage Systems*, **Materials** 2020, 13(4), 1016.
- C. Koczwar, C. Prehal, S. Haas, P. Boesecke, N. Huesing, O. Paris\*, *Towards real-time ion-specific structural sensitivity in nanoporous carbon electrodes using in situ anomalous small angle x-ray scattering*, **ACS Applied Materials & Interfaces** 2019, 11 (45), 42214.
- E. Mourad, Y. Petit, R. Spezia, A. Samojlov, F. Summa, C. Prehal, C. Leypold, N. Mahne, C. Slugovc, O. Fontaine, S. Brutti, S.A. Freunberger\*, *Singlet oxygen from cation driven superoxide disproportionation and consequences for aprotic metal-O<sub>2</sub> batteries*, **Energy and Environmental Science** 2019, 12, 2559.
- C. Prehal, S.A. Freunberger\*, *Li-O<sub>2</sub> Cell-scale energy densities*, **Joule** 2019, 3, 2, 321.
- P. Srimuk, J. Lee, Ö. Budak, J. Choi, M. Chen, G. Feng, C. Prehal, V. Presser\*, *In Situ Tracking of Partial Sodium Desolvation of Materials with Capacitive, Pseudocapacitive, and Battery-like Charge/Discharge Behavior in Aqueous Electrolytes*, **Langmuir** 2018, 34(44), 13132.
- N. Kostoglou, C. Koczwar, C. Prehal, V. Terziyska, B. Babic, B. Matovic, G. Constantinides, C. Tampaxis, G. Charalambopoulou, T. Steriotis, S. Hinder, M. Baker, K. Polychronopoulou, C. Dumanidis, O. Paris, C. Mitterer and C. Rebholz\*, *Nanoporous activated carbon cloth as a versatile material for hydrogen adsorption, selective gas separation and electrochemical energy storage*. **Nano Energy** 2017, 40, 49.
- C. Koczwar, S. Rumswinkel, C. Prehal, N. Jäckel, M. Elsaesser, H. Amenitsch, V. Presser\*, N. Huesing\*, O. Paris\*, *In situ measurement of electrosorption-induced deformation reveal the importance of micropores in hierarchical carbons*, **ACS Applied Materials & Interfaces** 2017, 9(28), 23319.
- S. Choudhury, B. Krüner, P. Massuti-Ballester, A. Tolosa, C. Prehal, I. Grobelsek, O. Paris, L. Borchardt, V. Presser\*, *Microporous novolac-derived carbon beads/sulfur hybrid cathode for lithium-sulfur batteries*, **Journal of Power Sources** 2017, 357, 198.
- M. Kratzer, M. Rubezhanska, C. Prehal, I. Beinik, S. V. Kondratenko, Yu. N. Kozyrev, and C. Teichert\*, *Electrical and photovoltaic properties of self-assembled Ge nanodomes on Si(001)*, **Physical Review B**, 2012, 86, 245320.

## INVITED PRESENTATIONS & SEMINAR TALKS

- C. Prehal, *Mesoscale phase transformation in beyond-intercalation-type batteries*, Department Chemistry and Physics of Materials, University of Salzburg, Austria, 11/2022
- C. Prehal, *Electrochemical phase transformation in confined geometry*, Institute of Physics, Leoben, Austria, 11/2022
- C. Prehal, *Mesoscale structure formation in beyond-intercalation-type batteries*, Max-Planck-Institute for Solid-State Research, Stuttgart, Germany, 10/2022

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C. Prehal, J.M. von Mentlen, H. Amenitsch, L. Porcar, S. A. Freunberger, V. Wood, *Operando X-ray and neutron scattering with stochastic modelling to quantify the nanoscale phase evolution in beyond-intercalation-type batteries*, Austrian Physical Society Annual Meeting 2022, Leoben, Austria, 09/2022

C. Prehal, S. A. Freunberger, V. Wood, *In situ exploration of in-pore redox processes for beyond intercalation-type energy storage*, CIMTEC conference 2022, Perugia Italy, 06/2022

C. Prehal, H. Amenitsch, V. Wood, S. A. Freunberger, *Nanoscale phase evolution in beyond intercalation-type energy storage systems*, Science@CERIC symposium, online, Synchrotron ELETTRA Italy, 01/2021

C. Prehal, *In situ SAXS/WAXS for beyond intercalation-type energy storage*, FRM II Forschungszentrum Jülich, München, Germany, 11/2020

C. Prehal, C. Koczwar, N. Jäckel, A. Schreiber, M. Burian, H. Amenitsch, M. A. Hartmann, V. Presser, O. Paris, *Structure and kinetics of ions in microporous carbon supercapacitors studied by operando X-ray scattering and modeling*, IMRC 2017, Cancun Mexico, 08/2017

C. Prehal, C. Koczwar, N. Jäckel, A. Schreiber, M. Burian, H. Amenitsch, M. A. Hartmann, V. Presser, O. Paris, *Combining modeling and in situ X-ray scattering to quantify ion charge storage in supercapacitor nanopores*, Advanced Light Source Lawrence Berkeley National Laboratory, Berkeley USA (CA), 03/2017

C. Prehal, D. Weingar, E. Perre, R. T. Lechner, H. Amenitsch, V. Presser and O. Paris, *In-situ SAXS/WAXS as a Novel Method to Study Ion Transport in Nanoporous Systems*, Symposium on "Ion Dynamics in Confined Systems", University of Cambridge 07/2014

## CONTRIBUTED PRESENTATIONS

C. Prehal, J.M. von Mentlen, S. Drvarič Talian, A. Vizintin, R. Dominko, H. Amenitsch, L. Porcar, S.A. Freunberger, V. Wood, *Operando small-angle scattering and cryo electron microscopy to quantify the multiphase nanostructure in beyond intercalation-type battery cathodes*, MRS Fall Meeting 2022, Boston, USA 11/2022

C. Prehal, J.M. von Mentlen, S. Drvarič Talian, A. Vizintin, R. Dominko, H. Amenitsch, L. Porcar, S.A. Freunberger, V. Wood, *Mechanism of Li<sub>2</sub>S formation and dissolution in Lithium-Sulfur batteries*, Swiss Battery Days 2022, EMPA, Dübingen, Switzerland. 08/2022

C. Prehal, S. A. Freunberger, V. Wood, *Systems materials engineering for post-lithium-ion batteries*, Arlberg Materials Science colloquium 2022, Lech am Arlberg Austria, 04/2022

C. Prehal, H. Amenitsch, S. A. Freunberger, V. Wood, *Operando X-ray scattering with stochastic modelling to quantify the nanoscale phase evolution in post-Li-ion batteries*, MRS fall meeting 2021, Boston USA 11/2021

C. Prehal, H. Amenitsch, V. Wood, S. A. Freunberger, *Nanoscale phase evolution in conversion-type lithium-sulfur and lithium-air battery cathodes*, EUROMAT 2021, online, Graz Austria 09/2021

C. Prehal, H. Amenitsch, V. Wood, S. A. Freunberger, *Mechanisms of reversible active material electrodeposition in Li-O<sub>2</sub> batteries and beyond*, ISE annual meeting 2021, online, South Korea 09/2021

C. Prehal, A. Samojlov, H. Amenitsch, S. A. Freunberger, *Nanoscale phase evolution in Li-O<sub>2</sub> batteries as seen by operando small angle X-ray scattering*, SAXS Excites, TU Graz, Austria 09/2019

C. Prehal, A. Samojlov, H. Amenitsch, S. A. Freunberger, *Physical and chemical energy storage in nanoporous carbons*, Porous materials at work: networking event on energy materials, TU Graz, Austria 07/2019

C. Prehal, A. Samojlov, H. Amenitsch, S. A. Freunberger, *Phase evolution in Li-O<sub>2</sub> batteries as seen by operando small angle X-ray scattering*, EMRS Spring Meeting 2019, Nice France 05/2019

C. Prehal, *Combining modelling and in situ scattering to study the phase evolution in conversion type batteries*, Materials and Device Engineering Group, ETH Zurich, 12/2018

C. Prehal, A. Samojlov, H. Amenitsch, S. A. Freunberger, *Phase evolution in Li-O<sub>2</sub> batteries as seen by in situ small angle X-ray scattering*, IUVSTA Workshop on Nanoporous Materials for Green Energy Conversion and Storage, Schloss Seggau Austria, 10/2018

C. Prehal, C. Koczwar, N. Jäckel, A. Schreiber, M. Burian, H. Amenitsch, M. A. Hartmann, V. Presser, O. Paris,

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*Combining modeling and in situ X-ray scattering to quantify ion charge storage in supercapacitor nanopores*, Gordon Research Seminar on Nanomaterials for Energy Applications, Ventura USA (CA), 02/2017

C. Prehal, D. Weingarth, M. Burian, H. Amenitsch, V. Presser and O. Paris, *Ion electrosorption studied by in-operando x-ray methods*, CDI&E 2015, Saarbrücken Germany 10/2015.

C. Prehal, D. Weingarth, M. Burian, H. Amenitsch, R. T. Lechner, V. Presser and O. Paris, *Ion transport in nanoporous carbon supercapacitors tracked by in-situ X-ray methods*, ISTP 2015, Leoben Austria 09/2015.

C. Prehal, M. Burian, H. Amenitsch, R. T. Lechner, V. Presser and O. Paris, *In-situ SAXS and X-ray transmission as complementary tools to study ion electrosorption in charged nanoconfinement*, SAS 2015, Berlin Germany 09/2015.

C. Prehal, D. Weingarth, R. T. Lechner, H. Amenitsch, V. Presser and O. Paris, *Tracking the global and local ion re-arrangement in carbon nanopores using in-situ X-ray methods*, CARBON 2015, Dresden Germany 07/2015.

C. Prehal, D. Weingarth, R. T. Lechner, H. Amenitsch, V. Presser and O. Paris, *Tracking the re-arrangement of ions in charged confinement using in-situ X-ray methods*, NESY Winterschool 2015, Altaussee Austria, 03/2015.

C. Prehal, D. Weingarth, E. Perre, R. T. Lechner, H. Amenitsch, V. Presser and O. Paris, *Ion transport phenomena in confined geometry studied by in-situ X-ray methods*, ÖPG Jahrestagung 2014, Pöllau, Austria

## OUTREACH, PUBLICATIONS NON PEER-REVIEWED

C. Prehal, C. Koczwar, N. Jäckel, A. Schreiber, M. Burian, H. Amenitsch, M. A. Hartmann, V. Presser, O. Paris, *Combining modeling and in situ x-ray scattering to quantify confinement and desolvation in nanoporous carbon supercapacitors*, **ELETTRA Highlights**, 2016/2017, 28 – 29.

C. Prehal, C. Koczwar, O. Paris, *Ion charge storage in disordered nanoporous carbons*, **Bi-annual report 2016/2017**, Institute of Physics, Montanuniversität Leoben, 2017, 11-12.

C. Prehal, C. Koczwar, N. Jäckel, A. Schreiber, M. Burian, H. Amenitsch, M. A. Hartmann, V. Presser, O. Paris, <https://www.elettra.trieste.it/science/top-stories/quantification-of-ion-confinement-and-desolvation-in-nanoporous-carbon-supercapacitors-with-modelling-and-in-situ-x-ray-scattering.html>, **ELETTRA Top Stories**, 03/04/2017

C. Prehal, C. Koczwar, H. Schönmaier, O. Paris, *Electrosorption in Microporous Carbons*, **Bi-annual report 2014/2015**, Institute of Physics, Montanuniversität Leoben, 2015, 10-11.

C. Prehal, D. Weingarth, E. Perre, R.T. Lechner, H. Amenitsch, O. Paris and V. Presser, *Ion electrosorption in nanoporous carbon supercapacitors studied by in operando SAXS*, **ELETTRA Highlights**, 2014/2015, 32 – 33.



## **OUTREACH, SELECTED REPORTS IN MEDIA**

Der Standard - online: Forschern gelingt neuer Einblick ins Innere von Superkondensatoren, 06/03/2017,  
<https://derstandard.at/2000053657776/Forschern-gelingt-neuer-Einblick-ins-Innere-vonSuperkondensatoren>

ORF: Leobner erforschen Superkondensatoren, 06/03/2017, <http://steiermark.orf.at/news/stories/2829316/>

Der Standard – print & online: Röntgenblick ins Innere von Superkondensatoren mit Teilchenbeschleuniger,  
22/02/2017, <http://derstandard.at/2000052955360-628/Roentgenblick-ins-Innere-von-Superkondensatoren-mit-Teilchenbeschleuniger>

Life-science.eu – online: Energiespeicher schneller laden, 08/10/2018,  
<https://life-science.eu/energiespeicher-schneller-laden/>

Eurekalert – online: New findings pave the way to environmentally friendly supercapacitors, 07/10/2020,  
[https://www.eurekalert.org/news-releases/483457\\_07/10/2020](https://www.eurekalert.org/news-releases/483457_07/10/2020)