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SE²A Newsletter 04/2021



Dear members and friends of the cluster SE²A,

still waiting for a going-back-to-normal we are all switching between working from home and workplace. Fortunately, the Cluster of Excellence SE²A is in a position to continue researching sustainable aviation concepts for the times when flying will not only be possible again but, as predicted, also in high demand.

For now, let's have a look at the cluster's engagement in equal opportunity, the open call for Junior Research Projects as well as new research projects and further activities in this newsletter.

With best regards,

Prof. Dr.-Ing. Jens Friedrichs
(Spokesperson SE²A)

Dr. Doris Pester
(SE²A-Managing-Director)

The SE²A-newsletter will be published three times per year. For further information please visit our website: www.tu-braunschweig.de/se2a

// OPEN CALLS

March 2021 - currently open

2nd Call for Proposals for a Junior Research Project in the SE²A Cluster of Excellence

The Cluster of Excellence SE²A offers additional financial support to advance highly innovative ideas and approaches of young scientists, thereby fostering the early career of highly qualified junior researchers.

This 2nd call for JRP proposals is focusing on research ideas and hypotheses in the following scientific topics:

- Hydrogen in aviation
This covers all aspects related to the processing of hydrogen on the „air side“ of the aviation industry, e.g. airport storage and logistics, aircraft storage, aircraft hydrogen conversion as well as H₂O emissions and climate impact.
- Thermal management & cooling
Here, fundamental solutions and technologies for heat transfer and control, heat loss management and cooling systems for on-board powertrains and related components shall be addressed.
- Technology assessment and optimization
Methods for technology assessment and optimization strategies shall be applied to or developed for topics 1 and 2 above.

Researchers on a post-doc level with an excellent record of publications and research experience, which are employed at one of the SE²A-cluster participating institutions can apply.

The application deadline is **May, 14th 2021**.

Detailed information on this SE²A funding program and application process can be found [here](#).



April 2021 - currently open

International Female Research Internship – a SE²A program to increase equal opportunity

The international female research internship program is an initiative in SE²A aimed at increasing the number of female researchers in the technical cluster research areas. It is open to female academics from abroad at the very beginning of their career after graduation with a master's degree who are interested in experiencing firsthand the research environment at one of the institutions of the SE²A cluster.

Beside the scientific work, the program also offers the participants the opportunity to partake in intensive German language courses. After completing the research internship, successful participants are expected to have accumulated sufficient research experience and German language skills to become eligible as doctoral researchers within the SE²A cluster.

[Find open positions here](#)

// LATEST NEWS

February 2021

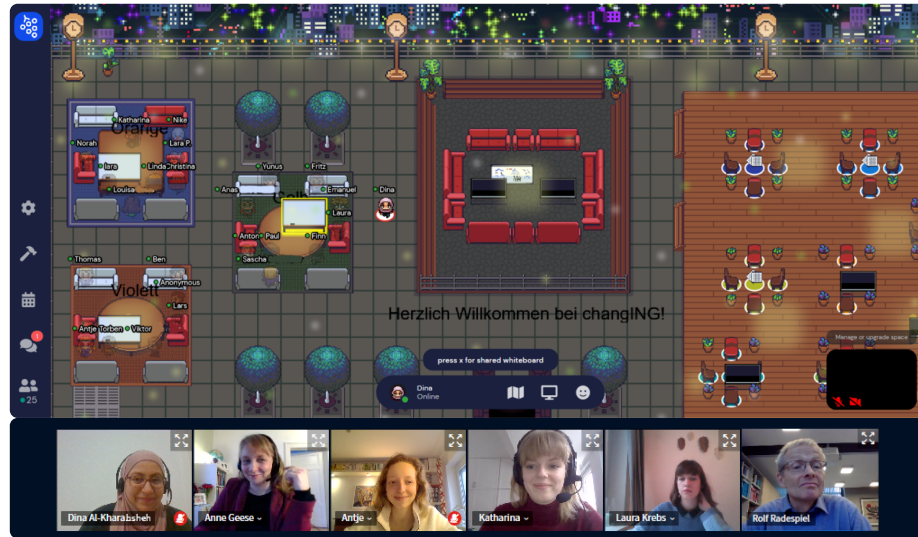
The SE²A research club changING launches its second round

About 24 high school students from the 10th grade onwards participated in the digital kick-off event of the new changING program on February 2nd, 2021.

The students were welcomed by Prof. Dr. Rolf Radespiel with an optimistic view into the future. After the presentation of the planned visits to e.g. the Institute of Acoustics, the Protohaus and other institutes, there was the opportunity to meet in small groups on the platform gather.town in a playful atmosphere and to get to know each other.

The changING club of the Cluster of Excellence SE²A deals with the transfer of knowledge of current scientific questions to pupils in the Braunschweig region. The aim is to give in particular female students the opportunity to deal with technical issues and to strive for a technical career. ChangING is organized by the researchers M.Sc. Dina Al-Kharabsheh and Dr. Anne Geese from the Institute for Science Education Research at TU Braunschweig, who carry out the project as part of the SE²A equal opportunity program.

[Read more](#)



February 2021

Paper of the Month - New Seminar in the Cluster of Excellence SE²A successfully launched

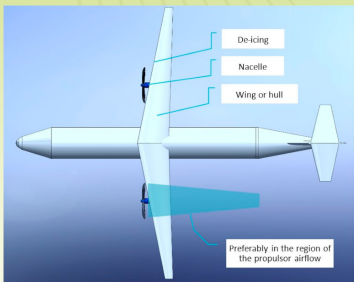
In our new seminar "Paper of the Month" you have the opportunity to present your high ranking SE²A-publication, to learn about the projects of your colleagues in the Cluster, and to exchange ideas. For having a lively interdisciplinary exchange across ICAs, all of you are kindly invited to join this seminar. Other interested colleagues at your institute are welcome as well (registration at conference-se2a@tu-braunschweig.de).

Jan Hoffmann opened the new format with the presentation "Impact of Current Density and Cooling on the Weight Balance of Electrical Propulsion Drives for Aviation".

The seminar will be held every last Wednesday of the month at 4:30 p.m..

Latest information about the upcoming Paper of the Month seminars will be published on our [news page](#) and on our [twitter account](#).

SE²A Paper of the Month: February 2021



Impact of Current Density and Cooling on the Weight Balance of Electrical Propulsion Drives for Aviation
<https://doi.org/10.3390/en13226149>

February 24th, 2021 - 16:30 pm - Presentation & Discussion
Jan Hoffmann - Wolf-Rüdiger Canders - Markus Henke

We welcome you to participate

February 2021

Lectures on Interdisciplinary Collaboration by Prof. Corinna Bath

In February 2021 Prof. Corinna Bath held two workshops on the topic of interdisciplinary collaboration. During the first workshop with a guest input by Prof. Ulrich Römer the participating researchers learnt about strategies for successfully publishing interdisciplinary research results. The second workshop dealt with disciplinary awareness as a factor for interdisciplinary collaboration. Many thanks to Corinna Bath for the interesting insights!



March 2021

SE²A supports first master's thesis in the "International Female Programme - international master's projects"

With the support of the SE²A "International Female Programme - International master's projects", master student Luisa Lindner started her research at the University of Rhode Island. In the next few months, she will model and assess the environmental impact of a long-range aircraft powered by fuel cells in her project.

As many people, she enjoys traveling by air, but is aware of the negative environmental impact as well. With the knowledge she acquired during her studies of mechanical engineering, she now wants to make a contribution to sustainable aviation. Her master's thesis focuses on systematically analyzing the environmental impact of a long-range aircraft, not only during its lifetime but also beyond, from production to disposal. The topic of sustainability is important to Luisa Lindner and runs through her studies for some time. The Cluster of Excellence is glad to support her in her endeavors within the SE²A International Female Program and looks forward to see which scientific insights she will bring back home.

The SE²A International Female Programme - International Master's projects is aimed at excellent female students who are about to start their Master's thesis. Participants are given the unique opportunity to write their thesis in the context of a student position. In addition to interesting insights into research practice, they specialize in a possible future field of work during their studies. Find open positions at the Cluster of Excellence SE²A [here](#).

Read more about Luisa Lindners stay at the University of Rhode Island [here](#).



Luisa Lindner in front of the engineering building at the University of Rhode Island

March 2021

News from the Research Training Group (RTG)

Although meetings are only possible online, our doctoral researchers have not been idle in organizing doctoral seminars for sharing their knowledge with each other. We would like to highlight the special commitment of Maximilian Rolinck and Hendrik Traub, elected representatives of the doctoral researchers, and Andrea Franco and Michelangelo Corelli Grappadelli. As part of the monthly SE²A doctoral seminar, Andrea and Michelangelo provided a webinar on the most common Reference Management Systems. Thanks to them, the other researchers now also have access to a 100-page-long-manual for these systems. We are sure that this is most helpful for everybody! For the upcoming doctoral seminar in May the TU Braunschweig University Library will give an overview on options for publishing Open Access. We are looking forward to the seminar!

Citavi Tutorial - Insert References in Word

To insert a citation:

1. Identify the item to cite (by authors, title, or other tags)
2. Select the entry on the **References** tab.
3. Click **Insert**.

The **Insert advanced** option allows to change the appearance of the citation

The screenshot shows the Citavi software interface. The 'References' tab is selected, displaying a list of references. A red circle highlights the 'Insert advanced' button. A red arrow points from the 'Insert advanced' button to the 'References' list. Another red circle highlights the 'Boiko, Kozlov et al. 1995 - Experimental investigation ...' entry in the list. A red arrow points from this entry to the 'Insert advanced' button. A third red circle highlights the 'View' dropdown menu, which is set to 'book'. A red arrow points from the 'View' dropdown to the 'Insert advanced' button. Below the screenshot, a sample citation is shown: (Boiko et al. 1995) and a full publication bibliography entry: Boiko, A. V.; Kozlov, V. V.; Syzrantsev, V. V.; Shcherbakov, V. A. (1995): Experimental investigation of high-frequency secondary disturbances in a swept-wing boundary layer. In *J Appl Mech Tech Phys* 36 (3), pp. 385–393. DOI: 10.1007/BF02369776.



March 2021

#youngresearchersofSE2A - new SE²A Twitter campaign

In our new Twitter campaign we would like to make the young researchers of our Cluster of Excellence more visible and value their research contributions.

Since March 2021, we present on a weekly basis a statement and photo of the young researcher as well as a link to the respective project. A new issue appears every Thursday. All previous posts can also be found under the hashtag #youngresearchersofse2a. You are also welcome to share our contributions.

[See more tweets](#)

"Specifically, our aim is to find new opportunities for the electrochemical production of fuels. We also want to know what happens at the molecular level in order to gain a better understanding of the processes."

Michael Guschakowski, M.Sc.- Sustainable Chemistry

The image features a circular portrait of Michael Guschakowski, a man with glasses and a beard, wearing a dark suit. To the right of the portrait is a graphic of a hand holding a flame, with wavy lines representing heat or energy. The background is a landscape with mountains and a blue sky.

March 2021

Opening of lecture series "Luftfahrt der Zukunft"

The seminar series was opened by the SE²A member Prof. Dr.-Ing. Sabine Langer (Institute for Acoustics) on March 22. In her lecture she gave insights into her research in the Cluster of Excellence SE²A: „Akustikgerechtes Design statt Lärmbekämpfung - Zukunft der Akustikforschung in der Luftfahrt“.

"Luftfahrt der Zukunft" is dedicated to developments in the field of aviation as well as the latest innovations in applications and solutions in aviation research. The German Aerospace Society (DGLR), the German Aerospace Center (DLR), the Aeronautics Research Centre Niedersachsen (NFL) and the Association of German Engineers (VDI), together with the Haus der Wissenschaft Braunschweig, present highly regarded experts who explain the current state of research and technology.

[More Information](#)



April 2021

Public relations support rewarded

Eight cluster members supported the Cluster of Excellence with their contributions and presentations in the recent months.

The successful launch of a new SE²A seminar format "Paper of the Month", together with contributions in the TU Braunschweig magazine in form of interviews and articles explaining the diverse research topics of SE²A, increased the visibility of the cluster.

We are pleased about the following contributions:

- [„Spannende Einblicke in die Luftfahrt für Schülerinnen und Schüler“](#)
Dr. Anne Geese & Dina Al- Kharabsheh, M.Sc.
- [„Mit BWL und Mathematik den Luftverkehr besser machen.Dr. Imke Joormann forscht mit ihrer Nachwuchsgruppe im Exzellenzcluster SE²A.“](#)
Dr. Imke Joormann
- [„Luftfahrt aus einer anderen Perspektive. Nachhaltig Fliegen: Was sich Reisende, Umweltschützer und Anwohnende wünschen“](#)
Dr. Sandra Buchmüller & Julia Stilke, M.A.
- [„Pores against Turbulence. Save fuel with newly designed wing surfaces“](#)
Hendrik Traub, M.Sc. & Siby Hose, M.Sc.
- [„Paper of the Month – February 2021: Impact of Current Density and Cooling on the Weight Balance of Electrical Propulsion Drives for Aviation“](#)
Dipl.-Ing. Jan Hoffmann

With thank for their efforts, the named people will each receive one of our limited SE²A mugs.



// RESEARCH

The Cluster of Excellence "Sustainable and Energy-Efficient Aviation" is an interdisciplinary research center with the purpose of investigating technologies for a sustainable and eco-friendly air transport system. Scientists from aerospace, electrical, energy and chemical engineering are working on the reduction of emissions and noise, as well as recycling and life-cycle concepts for airframes and improvements in air traffic management. Technische Universität Braunschweig, the German Aerospace Center (DLR), Leibniz University Hannover (LUH), the Braunschweig University of Art (HBK) and the National Metrology Institute of Germany (PTB) have joined forces in this extraordinary scientific undertaking. The Cluster organisation is structured in three Integrated Cluster Areas (ICAs) reflecting the mission-critical research demands and following a coherent and coordinated roadmap. The three ICAs resulting from our assessment of critical research demand are:

ICA A: Assessment of the Air Transport System

The goal of this cluster area is the development of comprehensive criteria and metrics for sustainable air transport that can serve as a basis for decision-making and future scenarios.

[more](#)



ICA B: Flight Physics and Vehicle Systems

This cluster area takes an in-depth look at technologies that have the potential to significantly reduce the power required from the propulsion system.

[more](#)



ICA C: Energy Storage and Conversion

Even with major advances in aircraft drag and propulsion efficiency, carbon emissions can only be reduced, while carbon-free aviation requires new concepts for the energy supply. The cluster looks at advanced lithium-sulfur chemistry for solid-state batteries as well as load bearing batteries.

[more](#)



// RESEARCH PROJECT ANNOUNCEMENT

New project with HBK started: „PEST Assessment of Air Transport System in alternative futures (SCENAIR)“

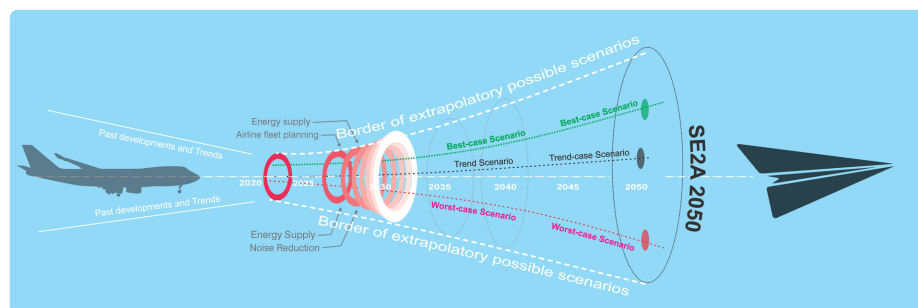
How will the relationship between the demand for aviation services and ticket prices evolve in the future?

The project “Scenarios for Air Transport System in alternative futures (SCENAIR) aims to provide a multi-criteria decision support for evaluating and optimizing future technologies developed within SE²A. This is achieved by delivering an updated scenario-research to previous studies CONSAVE 2050 and RACE 2050, yet with more focus on socioeconomic, cultural and life-style factors.

The project aims to establish reliable quantifiable prognoses of external factors as valuable input to other cluster projects for their simulations of optimization processes and thus deals with future-relevant questions.

The team of Scenair, Prof. Dr.-Ing. Gerhard Glatzel and Dr. Mehdi Mozuni from the Institute for Design Research at the Hochschule für Bildende Künste (HBK) Braunschweig encourages SE²A members to actively contribute as experts to Scenair's workshops and Delphi inquiries to address the complex issues of the project in an interdisciplinary approach.

[Read more](#)



New research project (ICA B): Extended Suction Surface Concept for Boundary Layer Laminarization

The long-term goal of this research is to show the efficiency of the extended suction surface concept as an advanced aircraft technology.

To determine the effective boundary layer transition-delay of advanced suction-sheets on hybrid laminar wings, wind-tunnel experiments in the DNW-NWB facility in comparison with direct numerical simulations of transitional Tollmien-Schlichting waves will be carried out in the scope of this project.

Comparisons between high-fidelity simulations and quick linear stability calculations have already shown capabilities and limits of the well validated linear stability theory design-approach by predicting advanced suction sheets without detailed simulation of the duct chamber.

This project will be under the lead of Dr.-Ing. Heinrich Lüdeke and Prof. Dr. Rolf Radespiel.

// ABOUT THE CLUSTER

Change in the Executive Board

We congratulate Prof. Dr. Thomas S. Spengler on his active admission to the [German Science Council](#). In addition, we would like to thank him very much for his valuable contributions as board member and ICA A coordinator in the cluster SE²A.

We also say goodbye to Prof. Dr.-Ing. Peter Horst and thank him for his valuable support as board member and ICA B coordinator in the cluster SE²A. For his retirement we wish him all the best.

We are pleased to announce and welcome Prof. Dr. Sabine C. Langer and Dr. André Bauknecht as new board members and ICA A and ICA B coordinators, respectively.

// EVENT ANNOUNCEMENT



Workshop „Scientific and research-related careers in the subjects of the clusters of excellence – reducing gender and family barriers“

May 10, 2021 | online

The first work package on typical career paths closes with a workshop (on invitation) for the participating clusters and SFBs. Prof. Eva Barlösius and her team will present first findings and discuss the ongoing agenda with the participating Clusters of Excellence and Collaborative Research Centers.



SE²A Paper of the Month: May

May 26, 2021 | online

In the fourth edition of our new seminar format, Sofia Pinheiro Melo will give a presentation on "Sustainability Assessment and Engineering of Emerging Aircraft

All of you are kindly invited to join this seminar. Other interested colleagues at your institute are welcome as well.

(registration at conference-se2a@tu-braunschweig.de)



Summer School
for doctoral researchers

SE²A Summer School for doctoral researchers September, 2021 | Braunschweig & online

The annual SE²A Summer School for doctoral researchers will take place in the second week of September 2021. Among other topics on the programme, there will be a 2-day-workshop on „How to approach your PhD-Thesis“ to prepare the researchers optimally for writing their thesis.



SE²A Cluster of Excellence Conference October 7-8, 2021 | Braunschweig

Please make a note! The lively scientific exchange will continue at the SE²A Cluster of Excellence Conference in October 2021: External speakers, SE²A researchers and guests will have again the opportunity to exchange their ideas, discuss approaches, and network.

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Imprint

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Aviation

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