

Positive Learning in the Age of InformaTiOn



THE ANNUAL NEWSLETTER

December 2022

Dear colleagues, we are pleased to share our highlights of 2022 and current progress in PLATO with you, and are looking forward to further collaboration with you in 2023.

Current State

While information and communication technology has an immense influence on our lives, little is understood about its particular effects on the way we learn. The international research program "Positive Learning in the Age of Information" (PLATO) aims to investigate learning in our knowledge- and multimedia-based society in a scientific, future-oriented approach.

PLATO is based on a highly interdisciplinary, international network of over 60 outstanding researchers with unique expertise in over 15 disciplines (incl. medicine, linguistics, psychology, economics, physics, and social, educational, communication and computer sciences), resulting in numerous joint projects and high-impact publications.

PLATO's interdisciplinary approach is one of the program's central strengths. The cooperation of researchers from various disciplines enables a holistic exploration of research questions on learning with the Internet in a way that would not be feasible for any single discipline.

TABLE OF CONTENTS

2

Network of Expertise

3

M-GRK
DIAPASON

5

Post-Doc Group

6

PLATO LAB

7

Research Project
'BRIDGE'

10

Public Relations

12

Special Track at
the IFKAD

13

Recent
Publications

15

Cooperation
Network



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Network of International Expertise

Over the course of the past year, the PLATO's extensive research network has grown even further. Outstanding researchers from a broad range of disciplines and research institutions, supported by an Advisory Board of internationally renowned experts, collaborate in the PLATO program. This year, we were able to expand the cooperation network further and welcome Tamara van Gog from Utrecht University and Christiane Fellbaum from Princeton university as new international principle investigators and cooperation partners.

Scientific Advisory Board



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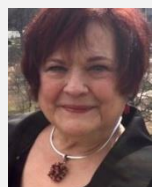


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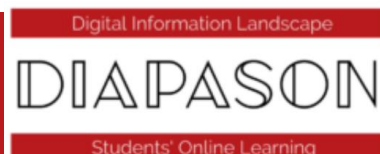


William B. Walstad,
U. of Nebraska-Lincoln

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Research Training Group (M-GRK)



As 2022 comes to a close, we look back on a successful year of the interdisciplinary Research Training Group "Digital Information Landscape and its Impact on Students' Online Learning" (DIAPASON). Focussing on the structural and semantic analysis of the online information landscape and its relationship with student learning in higher education economics and medicine, the fellows in DIAPASON presented their first findings at renowned national and international conferences. In addition, the fellows participated in about ten workshops from the General Postgraduate Program at JGU and further workshops of the EU project "RI LOOP".

For more information, please visit the [DIAPASON website](https://www.diapason.de).



DIAPASON fellow awarded by the Käthe and Ulrich Pleiß Foundation

The master's thesis of DIAPASON fellow Anika Kohmer, entitled "Development and Validation of a Training for the Assessment and Promotion of the Critical Use of Online Media", was awarded the prize of the Käthe and Ulrich Pleiß Foundation at this year's autumn conference of the Section for Vocational and Business Education in Freiburg.



Selected Presentations

- Braunheim, D. & Zlatkin-Troitschanskaia, O. (2022). *The relationship between prior experience in media use and critical online reasoning ability*. Presentation at the 2022 Joint Conference EARLI SIG 1 & 4, Cádiz, Spain.
- Kohmer, A. & Zlatkin-Troitschanskaia, O. (2022). *Development and Implementation of a Training to Assess and Improve University Students' Critical Online Reasoning*. Presentation at the Annual Meeting of the American Educational Research Association (AERA), 25.04.2022, San Diego, USA.
- Laufer, A. & Schemer, C. O. (2022). *The influence of cognitive abilities when evaluating information within an information problem online*. Presentation at the Annual Meeting of The European Higher Education Society (EAIR), Valletta, Malta.
- Laufer, A. & Zlatkin-Troitschanskaia, O. (2022). *The Influence of 'Need for Cognition' and 'Need for Cognitive Closure' when Solving an Information Problem*. Presentation at the International Forum on Knowledge Asset Dynamics (IFKAD), Lugano, Switzerland.



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Postdoc Group

The fruitful collaboration of the newly established PLATO postdoc group has resulted in numerous joint conference and journal contributions on many research projects (e.g., BRIDGE). After conducting several successful joint studies, the group has now started a new interdisciplinary project. We look forward to reporting more in the upcoming year.

Selected Publications

- Roeper, J., Reichert-Schlax, J., Zlatkin-Troitschanskaia, O., Klose, V., Weber, M., & Nagel, M. T. (2022). Patterns of domain-specific learning among medical undergraduate students in relation to confidence in their physiology knowledge: Insights from a pre-post study. *Frontiers in Psychology*, 12, 562211.
- Nagel, M. T., Reichert-Schlax, J., Zlatkin-Troitschanskaia, O., Klose, V., Weber, M., & Roeper, J. (2021). The relationship between medical students' media use and learning progress. *Studies in Higher Education*, 46(10), 2063–2073.
- Lücking, A., Brückner, S., Abrami, G., Uslu, T., & Mehler, A. (2021). Computational linguistic assessment of textbooks and online texts by means of threshold concepts in economics. *Frontiers in Education* 5, 578475.



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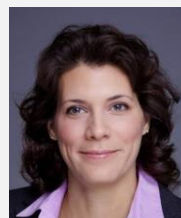
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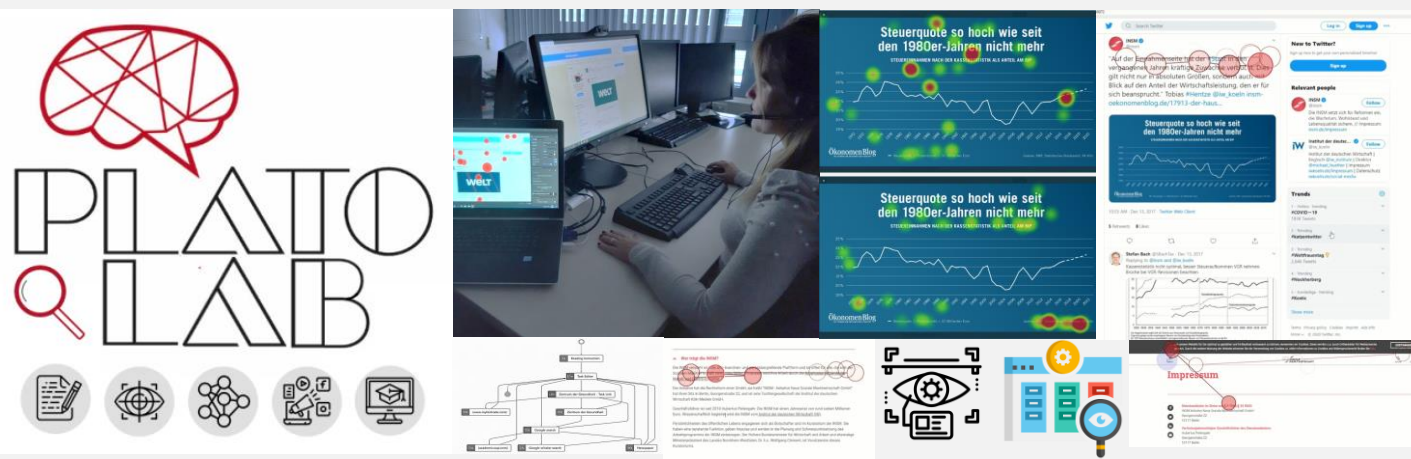


PLATO LAB

In 2022, we continued our work on assessing and analyzing students' information processing in digital environments using various performance assessments and eye tracking. Currently, we are working on several new eye-tracking projects, e.g. using the CORA tasks developed in BRIDGE, to gain deeper insight into the learning and searching process of students and young professionals (e.g., in medicine, law). In addition, we are expanding our current digital assessments and utilizing the PLATO Lab for other areas of application.

We are happy to have shared our research findings and experience with eye tracking to assess the response processes and task-solving strategies of Internet learners at international conferences and in journal contributions, e.g.:

- Brückner, S., & (2022). *Effects of Students' Study Progress in Economics on Their Visual Attention and Task-solving on an Economic Knowledge Test*. Paper presented at European Conference on Educational Research (ECER).
- Kunz, A.-K., Zlatkin-Troitschanskaia, O., Schmidt, S. & Brückner, S. (in review). Investigation of Students' Use of Online Information in Higher Education Using Eye Tracking. *Computers in Human Behavior Reports*.



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Research Project ‘BRIDGE’



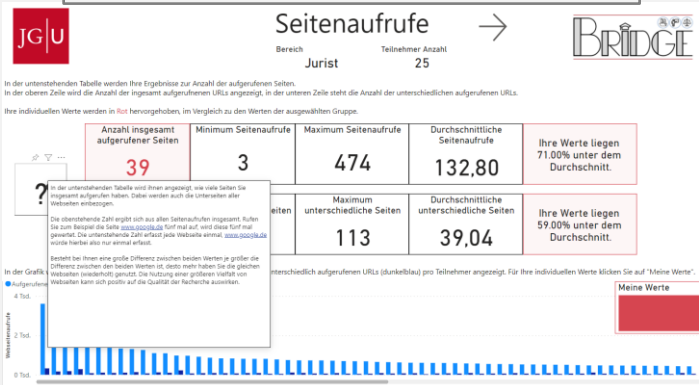
The BMBF-funded interdisciplinary, collaborative project "Practical educational processes in law and teacher training and medicine using digital media" (BRIDGE), can also look back on a successful year 2022.

BRIDGE investigates how the competent use of online information can be promoted using a newly developed digital training. In 2022, the deployment of a domain-specific and a generic digital training was successfully completed. All corresponding digital performance assessments have been evaluated.

In close collaboration with the PLATO Advisory Board and project cooperation partners from medicine, law, and teacher education, practical implications were derived in three *research-practice-transfer workshops* and used, e.g., for further developing digital trainings and interactive feedback tools for all BRIDGE participants.

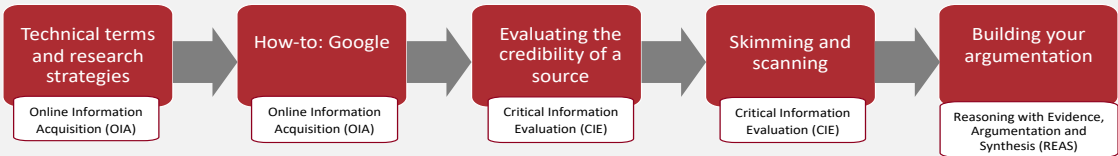
Currently, an evaluation of the training is taking place, followed by further development and adaptation of the training content.

New Feedback Plattform

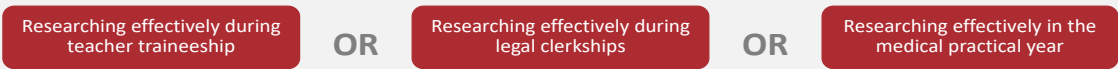


BRIDGE Training

GEN-COR



DOM-COR



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Research Project 'BRIDGE'



In 2022, the current research and development results from BRIDGE were presented at numerous (inter-)national conferences. For an overview of BRIDGE publications and further information, please visit our [BRIDGE homepage](#).



Selected Publications and Presentations

- Nagel, M. T., Zlatkin-Troitschanskaia, O., & Fischer, J. (2022). Validation of newly developed tasks for the assessment of generic Critical Online Reasoning (COR) of university students and graduates. *Frontiers in Education*, 7(914857). doi: 10.3389/feduc.2022.914857.
- Bültmann, A.-K., Zlatkin-Troitschanskaia, O., Schmidt, S. & Brückner, S. (2022). *Investigation of Students' Use of Online Information in Higher Education using Eye Tracking*. Presentation at 9th Conference of the Gesellschaft für Empirische Bildungsforschung (GEBF), 11.03.2022, online.
- Fischer, J., Zlatkin-Troitschanskaia, O., Bültmann, A.-K., Nagel, M.-T. & Maur, A. (2022). *Domain-specificity of online information use in solving job-related tasks in law, medicine, and teaching*. Presentation at the Annual Meeting of the American Educational Research Association (AERA), 22.04.2022, San Diego, USA.
- Nagel, M.-T., Zlatkin-Troitschanskaia, O., Kohmer, A., Kunz, A.-K., Fischer, J., Schmidt, S., Maur, A., & Brückner, S. (2022). The Relationship Between Web Search Behavior and Website Characteristics and Young Professionals' Critical Online Reasoning" at the symposium "Levels and Profiles of Young Professionals' Critical Online Reasoning in Law, Medicine, and Teacher Practice. Presentation at the 2022 WERA Focal Meeting, San Diego, CA.

Positive Learning in the Age of InformaTiOn



Research Project 'BRIDGE'



Selected Publications and Presentations (II)

- Fischer, J., Zlatkin-Troitschanskaia, O., Nagel, M.-T., Kunz, A.-K., Schmidt, S. & Maur, A. (2022). *Assessing sources used by teacher trainees while preparing lesson plans — log-file data analysis*. Presentation at the 2022 EARLI SIG 11 Conference, 23.06.2022, Oldenburg.
- Konca, M., Lücking, A., Mehler, A., Nagel, M.-T., & Zlatkin-Troitschanskaia, O. (2022). *Computational educational linguistics for 'Critical Online Reasoning' among young professionals in medicine, law and teaching*. Presentation at the 2022 WERA Focal Meeting 26.04.2022, San Diego, USA.
- Maur, A., Zlatkin-Troitschanskaia, O., Kunz, A.-K., Shenavai, K., Fischer, J., Nagel, M.-T. & Schmidt, S. (2022). *Profiles of Generic Critical Online Reasoning Among Young Professionals in Medicine, Law, and Teaching*. Presentation at the 2022 WERA Focal Meeting, 21.04.2022, San Diego, USA.
- Mehler, A., Konca, M., Nagel, M.-T., Lücking, A. & Zlatkin-Troitschanskaia, O. (2022). *On latent domain-specific textual preferences in solving Internet-based generic tasks among graduates/young professionals from three domains*. Presentation at 9th Conference of the Gesellschaft für Empirische Bildungsforschung (GEBF), 11.03.2022, online.
- Nagel, M.-T., Zlatkin-Troitschanskaia, O., Kunz, A.-K., Fischer, J., Maur, A. & Martin de los Santos Kleinz, L. (2022). *Die Fähigkeit zum kritischen Umgang mit Online-Informationen bei Lehramtsreferendaren im Fach Wirtschaft und Studierenden der Wirtschaftspädagogik im Vergleich*. Präsentation auf der Jahrestagung der Sektion Berufs- und Wirtschaftspädagogik der Deutschen Gesellschaft für Erziehungswissenschaft, 28.09.2022, Freiburg.
- Nagel, M.-T., Zlatkin-Troitschanskaia, O., Schmidt, S. & Molerov, D. (2022). *Zusammenhänge zwischen Critical Online Reasoning und Qualität der genutzten Online-Quellen bei BerufseinsteigerInnen*. Presentation at 9th Conference of the Gesellschaft für Empirische Bildungsforschung, 11.03.2022, online.

Positive Learning in the Age of InformaTiOn



Public Relations

Social Media

There have been some updates regarding our presence on social media. In cooperation with the Press and Public Relations Department of JGU, we have introduced PLATO on Facebook and Twitter via our university's account.

We have also updated our PLATO website, which provides in-depth information and relevant news and research updates:

<https://www.plato.uni-mainz.de/>



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Public Relations

Rhine-Main Universities (RMU) Alliance Open Day, October, 24th, 2022

At the RMU Open Day, PLATO presented its research framework and current studies and findings during a poster presentation at GU Frankfurt.

Interdisciplinary and domain-specific workshops with partners from educational and professional practice in law, medicine and teacher education

To provide our practice partners with findings from the current PLATO research projects, several practice workshops on various domain-specific and interdisciplinary topics took place during 2022.

PLATO PIs have published new blog posts in **The Real World of College**

<https://www.therealworldofcollege.com/blog/teaching-critical-reasoning-in-the-information-age-part-12>

Goethe-Universität Frankfurt am Main
Johannes Gutenberg-Universität Mainz
Technische Universität Darmstadt
Eine strategische Allianz

Rhein-Main
Universitäten

Positive Learning in the Age of Information (PLATO)

PLATO is an international and interdisciplinary program researching how higher education students learn using the World Wide Web (online learning), and how to best foster related skills. PLATO examines the 'information landscape' that students and graduates use for learning, including media, technology, language, content, and online didactic features.

- Online Learning**
What are key characteristics of self-directed online learning, and systematic differences to lecturer-guided learning in institutionalized university contexts? How do students select, evaluate, and use online sources and information, e.g. when studying on domain-related topics?
- Information Landscape and Media Features**
What characteristics and features of the online information landscape become apparent in an in-depth multidisciplinary analysis, and how do they differ from recommended learning materials? How do features affect learning processes online (e.g., regarding accuracy or trust in information)?
- Learner Characteristics and Learning Outcomes**
How do online learning processes interact with effects of student characteristics, and how does this affect learning outcomes?
- Learning Interventions**
How can we provide tailored online learning that takes into account student characteristics, online learning environments, and information use strategies, to foster more positive learning outcomes?

Current studies and analyses

- Eye-tracking study with students in economics, physics and medicine
- Students' media use and domain-specific knowledge in different domains
- Process mining: Log data analysis of students' web searches
- Network analysis of process-related learning behavior
- Information semiotics and narratives and their impact on student learning
- Computational linguistics analysis of learning media

Current projects

- iPAL** International Collaborative for Performance Assessment of Learning in Higher Education – Research and Development
- CORE** Critical Online Reasoning Assessment – Valid assessment of students' skills in using online information
- BRIDGE** Performance Assessment of Domain-specific and Generic Use of Online Media by Young Professionals in Law, Medicine, and Teacher Training
- DIAPASON** Digital Information Landscape and its Impact on Students' Online Learning

Prof. Dr. Olga Zlatoska-Trochanskaya
Prof. Dr. Mita Banerjee
Prof. Dr. Walter Brang
Prof. Dr. Marcus Meyer
Prof. Dr. Christian Scherer
Prof. Dr. Jeroen Simons

Prof. Dr. Frank Goldammer
Prof. Dr. Johannes Kesting
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Special Track at the IFKAD



In 2022, PLATO was represented with a Special Track at the annual IFKAD (International Forum on Knowledge Asset Dynamics) conference. The 17th IFKAD conference was held in Lugano, Switzerland, on June 20–22, 2022.

The Sessions in the PLATO Special Track “*Knowledge Acquisition at Risk*”, included ten presentations on challenges and opportunities of online knowledge development, the online information landscape, and informal learning online.

Session 1

M. Banerjee, O. Zlatkin-Troitschanskaia. Higher Education Knowledge Development in the Information Age: Fostering Students’ Critical Online Reasoning and Narrative Competence through Performance Tasks

Lutsyk-King, Y. Cui, M. Cutumisu, Y. Gao, J.P. Leighton. Assessing Data Literacy: Cognitive Processes and Biases in the Digital Arena

I. Kavalchuk, E. Orel, K. Tarasova, D. Talov, A. Belyaeva, D. Federiakin. How Critical Thinking Manifests itself in an Unconstrained Online Environment: Preliminary Results from Feasibility Study

G. Vladova, J. Haase, N. Gronau “The Medium Is the Message” – Influence of Digital Media on the Questioning Behaviour in the Auditorium

R. Shavelson, O. Zlatkin-Troitschanskaia. Belief in Education for Addressing Digital Age Challenges and the Fundamental Attribution Error

Session 2

J. Fischer, O. Zlatkin-Troitschanskaia, J. Hartig, F. Goldhammer. Collecting and Analyzing Students’ Process Data through Digital Performance Assessments: A Synopsis of the Current State of Research

S. Müller, L. Forsblom, E. Gutzwiller-Helfenfinger. Entrepreneurship Education and Negative Knowledge: Learning from Other People’s Failure

N. Ronderos, D. Holtsch, S. Forster-Heinzer, R.J. Shavelson, J. Mariño, G. Solano-Flores. Critical Thinking as Part of Teacher Education in Switzerland

Laufer, A. & Schemer, C. The Influence of Need for Cognition and Need for Cognitive Closure when Solving an Information Problem

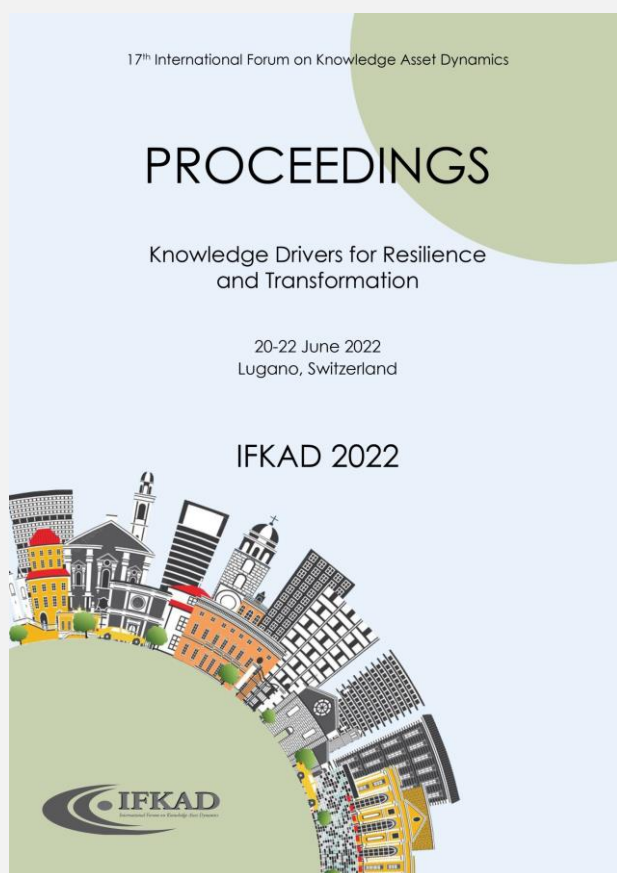
C. Meier, U. Jäckli, R. Krell. Leadership in the Digital Age: Trying to Assess its State in Swiss Companies through Machine Learning

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Recent Publications

Papers from the PLATO Special Track were published in the conference proceedings.



**eBook Proceedings IFKAD 2022,
Lugano, Switzerland 20-22 June
2022**

*Knowledge Drivers for Resilience
and Transformation*

ISBN: 978-88-96687-15-4, ISSN
2280-787X

pdf eBook

Recent Publications

Special Issue



Progressions in Learning in the Age of (Mis)information Age (PLATO) - Advances in Higher Education Learning Research

In 2022, PLATO published a further Special Issue with nine contributions in the renowned international journal **Studies in Higher Education**: Vol 46, No 10 (tandfonline.com)

“The focus of this special issue is on learning in the age of information which is also known as the digital or computer age where the economy is primarily based on information technologies. [...]

This issue has contributions from educational and cognitive psychologists, teacher educators, linguists and computer scientists. ”

(Jungblut, J., & Lee, M. (2021). Foreword. *Studies in Higher Education*, 46(10), 1991-1992. Retrieved from <https://www.tandfonline.com/toc/cshe20/46/10>)



Positive Learning in the Age of InformaTiOn



News from the Cooperation Network

Cooperation partners hosted a symposium

at Schloss Dagstuhl – Leibniz Center for Informatics:

“The Dagstuhl Seminar on ‘**Technologies to Support Critical Thinking in an Age of Misinformation**’ ran over a course of three days in April 2022. Each day focused on one specific aspect of the problem of Misinformation and the role technologies play in its worsening and mitigation. ...”

Read the participant report here:

https://drops.dagstuhl.de/opus/volltexte/2022/17281/pdf/dagrep_v012_i004_p072_22172.pdf

with keynotes by

Emma Spiro, Andreas Dengel, Niels van Berkel, Laurence Devillers, Stephen Lewandowsky, and Roger Taylor

Event:

<https://www.dagstuhl.de/seminars/seminar-calendar/seminar-details/22172#participants>

Organized by: Andreas Dengel, Laurence Devillers, Tilman Dingler, Koichi Kise, Benjamin Tag