



GENEALOGY OF POPULAR SCIENCE

FROM ANCIENT ECPHRASIS TO VIRTUAL REALITY

June 15–17, 2018

International Conference on the
Transformations of the Popularization of Science
from Antiquity to Our Days

CVs AND ABSTRACTS OF ALL SPEAKERS



**INTERNATIONAL
CONFERENCE
JUNE 15-17, 2018**

Genealogy of Popular Science. From Ecphrasis to Virtual Reality
CVs and Abstracts of all Speakers

GENPOP2018, International Conference, June 15-17, 2018,
Fritz-Haller-Hörsaal, Building 20.40, Englerstr. 7, KIT Campus South, Karlsruhe
Lecture: 30 Minutes / Work-in-Progress Talk: 15 Minutes

Friday, June 15, 2018

16:00 Admission & Registration

16:30 Salutations and Introduction

Salutation

Prof. Dr. Caroline Y. Robertson-von Trotha,
Karlsruhe Institute of Technology, ZAK

**Von Honig, VR-Brillen und wahrer Medizin – Ursprünge
und kulturelle Transformationen der “Populärwissenschaft” (Lecture)**

Dr. Jesús Muñoz Morcillo, Karlsruhe Institute of Technology, ZAK

**Welcome Speech of the Vice President
for Innovation and International Affairs**

Prof. Dr. Thomas Hirth, KIT Presidential Committee

17:30 ON THE TRAIL OF POPULAR SCIENCE IN ANTIQUITY I

Hero of Alexandria’s Theater of Mechanics (Keynote Lecture)

Associate Prof. Dr. Courtney Ann Roby, Cornell University, Ithaca, New York

Mythology at the Greek School: The Testimony of the *Progymnasmata*
(Keynote Lecture)

Prof. Dr. José Antonio Fernández Delgado, Universidad de Salamanca

18:45 Refreshment Break

19:00 ON THE TRAIL OF POPULAR SCIENCE IN ANTIQUITY II

**Das Reich der Muränen, Delphine und Kraken – das Wissen über das Meer
und seine Bewohner in der römischen Kaiserzeit (Lecture)**

Dr. Dorit Engster, Universität Göttingen

**The Celestial Axis in Manilius’ *Astronomica* (1. 275-293):
Paradox and Sublime (Talk)**

Matteo Rossetti, University of Milan

**Die Panathenäischen Preisamphoren als Kommunikationsmedium
mythologischen, historischen und kulturellen Wissens (Talk)**

Martin Streicher, Rheinische Friedrich-Wilhelms-Universität Bonn

20:30 Reception

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Saturday, June 16, 2018

9:00 ON THE TRAIL OF POPULAR SCIENCE IN ANTIQUITY III

(Popular) Scientific Knowledge and its Rhetorical Use in Aristotle (Lecture)
Prof. Dr. María J. Martín-Velasco, Universidad de Santiago de Compostela

Populärwissenschaftliche Argumentationsschemata in der Zweiten Sophistik am Beispiel der *Apologia* des Apuleius von Madaura (Talk)
Maurice Parussel, Ruhr-Universität Bochum

Ekphrasis as Device for Knowledge Dissemination in Euripides (Talk)
Sara Matías Pérez, Universidad de Salamanca

***moris mihi restat origo* – Aetiology and Popular Science** (Lecture)
Dr. Anke Walter, Newcastle University

11:00 Refreshment Break

11:15 BETWEEN ANTIQUITY AND MODERNITY

Wissensordnung und Wissenspopularisierung: Konstanten und Wandlungen in der vormodernen Enzyklopädie (Lecture)
Prof. Dr. Mathias Herweg, Karlsruhe Institute of Technology,
Institut für Germanistik

***Was Cometen eigentlich seyen* – Zur Vermittlung naturkundlichen Wissens in der ephemeren Kometenliteratur der Frühen Neuzeit** (Keynote Lecture)
Prof. Dr. Marion Gindhart, Johannes Gutenberg Universität Mainz

**More Publicity Through Very Short Books:
Historical Epitomes in Late Antiquity and Renaissance** (Lecture)
PD Dr. Markus Sehlmeier, Universität Osnabrück

13:15 Lunch Break

14:00 AGE OF ENLIGHTENMENT AND BEYOND: REASON AND FUN WITH NATURAL SCIENCES

Vom vernünftigen Vergnügen zum Spaß an der Wissenschaft. Kontinuitäten in der Geschichte der Wissenschaftspopularisierung seit der Aufklärung (Keynote Lecture)
Dr. Oliver Hochadel, IMF-CSIC, Barcelona (Spanish National Research Council)

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**Science in the Box. History and Cultural Impact
of Popular Scientific Kits (Lecture)**

Prof. Dr. Verena Kuni, Goethe Universität Frankfurt am Main

**Innovative Popular Science Communication? Materiality's, Aesthetics and
Gender of New Science Communication in the Genre of Science Slam (Lecture)**

Dr. des. Miira Hill, Technische Universität Berlin

16:00 Refreshment Break

16:15 MODERN TIMES: POPULARIZATION OF – AND THROUGH – ART

Handbuchskepsis vs. Markterfolg.

Wie wurden optische Zeichenhilfen 1800 – 1850 populär? (Keynote Lecture)

Prof. Dr. Dr. Erna Fiorentini, Karlsruhe Institute of Technology,
Institut für Kunst- und Baugeschichte

**Klare Spiegel, zersprungene Scheiben – Newton
und die Kunst des Trompe-l'œil (Lecture)**

Prof. Dr. Oliver Jehle, Karlsruhe Institute of Technology,
Institut für Kunst- und Baugeschichte am KIT

Wilhelm Lübke – Kunstgeschichte für das Feuilleton (Talk)

Dr. Alexandra Axtmann, Karlsruhe Institute of Technology,
Institut für Kunst- und Baugeschichte

18:00 Refreshment Break

18:15 MODERN TIMES: VISUAL CULTURES AND ARTISTIC APPROPRIATION OF POPULAR SCIENCE

Bildtechnische Avantgarden (Keynote Lecture)

Dr. Matthias Bruhn, Humboldt-Universität zu Berlin

**Die Aneignung und Verbreitung wahrnehmungsphysiologischer Terminologie
als apologetische Strategie im Künstlermanifest? Das Beispiel Kandinsky (Talk)**

Beatrice Immelmann, Institut für Kunstgeschichte, Universität Wien

Sunday, June 17, 2018

9:30 NEW – AND OLD – STRATEGIES OF SCIENCE POPULARIZATION I

**From “The Destroyer of Worlds” to “Atoms for Peace” (and back?) – Discourse on
Nuclear Power in US Popular Science Journals during the Early Cold War Era (Lecture)**

Lars F. Köppen, Stiftung Historische Museen Hamburg

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**Theatrum cerebri: *Gehirn & Geist* und die visuelle Kultur
populärer Hirnforschung** (Lecture)

Dirk Hommrich, Institut für Technikfolgenabschätzung und Systemanalyse
(ITAS) des Karlsruher Instituts für Technologie (KIT)

11:00 Refreshment Break

11:15 NEW – AND OLD – STRATEGIES OF SCIENCE POPULARIZATION II

**Schulen des Sehens: Popularisierungen wissenschaftlichen
und wissenschaftsforschenden Wissens in Kinofilmen und Comics** (Lecture)

Dr. des. Kathrin Klohs, Universität Basel

**Popular Aesthetics of the 19th Century – A Concurrent Story to the History of
Design, Investigated through an Analysis of Illustrations in the Periodical Press**
(Talk)

Elin Manker, Stockholm University

**Geschichte und medienpolitische Implikationen
visueller Naturmetaphern der Kybernetik in der Digitalkultur** (Talk)

Lena Trüper, Goethe-Universität Frankfurt

12:45 Discussion

Scientific Head:

Dr. Jesús Muñoz Morcillo & Prof. Dr. Caroline Y. Robertson-von Trotha,
ZAK | Center for Cultural and General Studies

Scientific Partners:

Prof. Dr. Oliver Jehle & Dr. Alexandra Axtmann,
Institut für Kunst- und Baugeschichte am KIT, Fachgebiet Kunstgeschichte
Prof. Dr. Mathias Herweg,
Institut für Germanistik, Abteilung Mediävistik und Frühneuzeitforschung

Organization:

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Dates:

Friday, June 15, 2018, 4:00 p.m. – 8:30 p.m.

Saturday, June 16, 2018, 9:00 a.m. – 7:00 p.m.

Sunday, June 17, 2018, 9:30 a.m. – 1:00 p.m.

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SALUTATION AND INTRODUCTION

Prof. Dr. Caroline Y. Robertson-von Trotha, *Karlsruhe Institute of Technology*

Prof. Dr. Caroline Y. Robertson-von Trotha was born in Glasgow/Scotland in 1951. After her studies in sociology, philosophy, and history in Heidelberg and Karlsruhe, she finalized her doctoral dissertation in sociology and habilitated at the University of Karlsruhe (now Karlsruhe Institute of Technology, KIT) in 2004. She is a founding member and director of ZAK | Centre for Cultural and General Studies at the Karlsruhe Institute of Technology (KIT).

Her research focuses on cultural change and globalization, internationalization, multiculturalism, as well as theory and practice of public science. She is a coordinator of the German network of the Anna Lindh Foundation, member of the Culture Committee of the German UNESCO Commission, and chairlady of the Academic Council for Culture and Foreign Policy (WIKA) at the Institute for Foreign Cultural Relations (ifa).

Dr. Jesús Muñoz Morcillo, *Karlsruhe Institute of Technology*

Jesús Muñoz Morcillo's first degree (Licenciatura) was in Classics at the Department of Classical Philology and Indo-European Languages of the University of Salamanca (2001). After a year as DAAD awardee at the Julius Maximilian University of Würzburg, specializing in epicurean philosophy, he obtained a Master's degree (2008) in Art History, Media Theory, and Aesthetics, and a PhD degree from the University of Arts and Design in Karlsruhe (2015). In 2009, he joined ZAK | Centre for Cultural and General Studies at Karlsruhe Institute of Technology (KIT). He is currently a research fellow at ZAK and lecturer at the Institut für Kunst- und Baugeschichte at KIT.

About Honey, VR-Goggles, and Real Medicine – Origins and Cultural Transformations of “Popular Science”

Despite the efforts of modern scholars to explain the origins of science communication as an intricate phenomenon with sociopolitical and aesthetical dimensions, most research fields concerned, such as History of Science and Technology Studies, approach the popularization of science from the perspective of present issues, mostly ignoring its historical roots in the classical culture. Classicists, on the other hand, analyze (popular) scientific writings from a philosophical and not cultural perspective. Even rhetorical analyses are seldom concerned with visual culture or communication qualities that serve the popularization of knowledge. In this introductory lecture, our aim is to propose a new approach to this subject focusing on rhetoric, visual, and cultural techniques that promoted the popularization of knowledge since the Greco-Roman world.

Whether the Aristotelian notion of universal, etiological episteme, Galileo's *nuova scienza* based on demonstrations *ex suppositione*, or today's positivistic notion of science based on

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empirical evidence, the different approaches to scientific activity always mirror the corresponding sociocultural and political contexts. In the same way, the production and distribution of knowledge for the public have transformed over the ages. Ancient philosophers, scholars of The Middle Ages, universal geniuses of the Renaissance, or modern scientists did not just pass down “pure knowledge” whenever they used to communicate science. The interdependence between science communicators and their respective audience implies the use of verbal and visual persuasion strategies. In the communication process, the scientific content itself is not as important as the rhetoric skills and the intention of the science communicator in question. The history of popular science is one of rhetorical persuasion, politics, aesthetics, and scientific myths that started in ancient times. This lecture introduces some practices related to the popularization of knowledge in the ancient world and the recurrence of some of these techniques in later times. Furthermore, it proposes a new, diachronic understanding of popular science communication as a complex, recurrent communication structure that both adapts to and coins the dominating societal and political reality.

ON THE TRAIL OF POPULAR SCIENCE IN ANTIQUITY I

Prof. Dr. Courtney Ann Roby, Cornell University, USA

Professor Roby’s research interests focus on the literary aspects of scientific and technical texts from the ancient world, the interaction of verbal and visual elements in those texts, and the definition and dissemination of scientific work. Her first book (*Technical Ekphrasis in Greek and Roman Science and Literature: The Written Machine between Alexandria and Rome*, Cambridge University Press 2016) traces the literary techniques used in the textual representation of technological artifacts from Hellenistic Greece to late-ancient Rome. Her new book project focuses on Hero of Alexandria, whose multidisciplinary technical treatises spanned topics from pure geometry to the construction of mechanical automata, and who remained an influential figure in the history of mechanics throughout the 18th century. Other recent, current, and forthcoming projects address how contemporary philosophy of science can help us understand the “scientific fictions” of Seneca’s *Natural Questions*, how cognitive-scientific ideas of “extended mind” are reflected in Ptolemy’s astronomical and harmonic works, and how early printed editions of ancient technical treatises rework ancient authors’ materials for a new context of production and propagation.

Hero of Alexandria’s Theater of Mechanics (Keynote)

Hero of Alexandria, who probably lived in the first century CE, composed works on an astonishing variety of technical topics, ranging from theoretical mechanics and geometry to applications like surveying, pneumatics, and catapult design. Throughout his varied corpus, he asserts that his goal is to select the best and most reliable solutions made by his predecessors, add some novelties of his own, and assemble the whole into a form that allows optimal accessibility and utilization by his reader. The explanatory techniques he uses to bring his technical subjects to a broad audience include the use of diagrams, drawing examples from everyday life,

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and creating opportunities for the reader to observe mechanical and physical principles at work in familiar objects. Sometimes, the “experimental theaters” he creates through text take the form of experiments that the reader could perform for himself, while others are purely textual creations that invoke the reader’s imagination as the site of experimentation.

Hero’s works enjoyed a vigorous reception in early modern Europe, where translators like Federico Commandino and Bernardino Baldi made his texts accessible to new audiences. Others, like Giovan Battista Aleotti, added novel designs to their translations of Hero just as Hero himself had to his predecessors’ ideas. Others, like Salomon de Caus and Giambattista della Porta, integrated his mechanical and physical ideas in their own works. As Hero’s ideas were transmitted through a new milieu of composition and experimentation, the “theaters” employed by his translators and commentators changed as well, incorporating new objects for comparison and new experimental protocols. For example, in Aleotti’s commentary to the preface of Hero’s *Pneumatica*, he observes that while Hero used medical cupping-glasses as an example to help his reader imagine the rarefaction and condensation of air, such devices are no longer in common use, so Aleotti instead relies on contemporary analogues ranging from breast pumps to firearms.

This paper will analyze the techniques Hero uses to make his varied subject matter come alive for a broad readership, especially his use of diagram and analogy to explain the mechanics of his artifacts through reference to more familiar objects. I will then trace the shifts in those techniques as Hero’s works were propagated through new intellectual environments and technologies of book production centuries later. In particular, we will place special interest on his *Pneumatica* and *Automata*, which enjoyed rich receptions in the early modern period.

Prof. Dr. José Antonio Fernández Delgado, *Universidad de Salamanca, Spain*

José Antonio Fernández Delgado is Emeritus of the University of Salamanca. He obtained his PhD degree in 1976 at the same University and was a full professor of Greek Philology since 1987, first at the University of Extremadura and then at the University of Salamanca from 1991 until 2017. He was awarded several grants, among them the Alexander von Humboldt grant for research activities at the Freie Universität Berlin (1986, 1987, and 1992) and, later, at the Humboldt-Universität Berlin (2009). Some of his lines of research are ancient poetry, orality in Greek literature, intertextuality in Greek and Latin Poetry, school papyri, and school and literature in Greece. He has published 10 books, among them a translation of Hesiod’s poetry, and more than 150 articles in renowned journals and edited volumes. He was a member of the Steering Committee of the Coimbra Group of European Universities (1997-2001, 2001-2003), among other academic management posts.

Mythology at the Greek School: The Testimony of the *Progymnasmata* (Keynote)

Basically, the sources we have at our disposal for the study of school mythology in Greece are of two kinds. The first is papyri and other writing media (wood tablets, ostraca, parchemins), which are generally used at school or the school sphere (some inscription). The second is the rhetoricians’ theory, which in turn has two kinds of manifestations, the progymnasmatic theo-

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ry and the wide series of rhetoric compositions destined to serve as models for school practice. My research on the use of mythology in Greek schools initially focused on both aspects of rhetoricians' theory. My current research will be centered on the school exercises on papyri and other materials, the richness of whose mythological contents already assures that these are no less abundant than that attested in the theoretical part.

The testimonies studied will not cover all the school exercises, a huge part of which hardly has any mythological content. Rather, the focus shall be on the *progymnasmata*, or school exercises used as the introduction to the study of rhetoric at the end of the *grammatikos* class. To this end, I will use the corpus of *progymnasmata* on papyrus and other materials, the only one existing that has been recently assembled and presented as a doctoral thesis at the University of Navarra. In this way, my contribution to the present conference, together with the aforementioned contribution, will try to fill a gap that exists in the bibliography on the Greek-Roman school – however strange it might be displaying a mythological thematic in a field that is so propitious, so inherent in the classical literature and culture in general.

ON THE TRAIL OF POPULAR SCIENCE IN ANTIQUITY II

Dr. Dorit Engster, *Universität Göttingen, Germany*

Dr. Dorit Engster studied history, Latin and English philosophy at Göttingen and Cambridge University. Currently, she teaches at the department of Ancient History, Göttingen. Her research focuses on history of religion, history of ancient science, Rome and the Hellenistic states, Roman Germania and Roman Britain, ideas of norms and values, as well as representation and legitimation of rules.

The Kingdom of Moray Eels, Dolphins and Octopuses – The Knowledge about the Sea and its Inhabitants in the Roman Empire

The foundation of modern biology was laid in the 4th century BC. Aristoteles' study of nature was a central work for a long time. Despite its methodological deficiencies, it was formative during the whole ancient epoch. After Aristoteles, biological studies were pursued further and extended partially. The scientific focus on nature was thus pushed into the background. Scientific topics were published in "popular-science-scripts", the so-called "Buntschriftsteller", whereby the sea environment was of great interest. In particular, there was a special interest in the analysis of fish and sea mammals, their habits, hunting instincts, nutrition, and sexual behaviors.

The authors were accused of pseudo-scientific and methodological mistakes. In fact, myths and legends, anecdotes and curiosities are the focus of these depictions. The systematic method of the peripatetic school was abandoned and one tried to present the contents of sea life from a perspective that is as varied as possible. However, the criticism of late-ancient au-

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thors (like Plinius, Athenaeus, Aelian, Plutarch, or Oppian) is unfounded. It doesn't take the audience and the end targets into account. These popular science scripts addressed the academic upper class, not a small group of scientists, which wanted to gain a general knowledge about sea dwellers. Thus, the focus was on amusing and curious stories because the knowledge gained was used in the context of banquets and soirées.

The reader should be able to make some remarks about the served fish and sea life in general. It was intended to initiate a lively debate. Here, anecdotes and myths about fish therefore helped contemplate and talk about human and animal behavior, ethics and moral, divine work in the world. These scripts were not aimed at transferring "dry" scientific knowledge. Rather, they aimed to enable the reader to have an intellectual conversation, to respond to statements of other guests, and to comment on the food served at banquets. That's the reason why the scripts, like Plinius nature study, also included cooking recipes. Ancient mosaic depictions are an interesting parallel to the descriptions of fish in poetry and prose. Here, the sea environment is a popular topic as well. It depicted different fish species in a very realistic and detailed manner. The mosaics show a wide range of sea animals such as food-fish, dolphins, and octopuses. Myths in which sea animals play an important role, like stories about dolphin riders, are popular subjects too. The depictions reflect a very detailed content of scientific scripts from the late ancient era. A guest was able to prove his knowledge by explaining the depictions and establishing the link between the fish at the mosaic and the served meal.

This lecture aims to show the relevance of popular-scientific scripts and depictions for the Roman upper class and their debates using selected examples (like dolphins, octopuses, wales, and food-fish). It should be emphasized that these sources aren't faulty and superficial at all but were rather intended to educate the Roman elite.

Matteo Rossetti, *University of Milan, Italy*

Matteo Rossetti studied Classics at the Pavia University, Italy. He has also worked as a lecturer at the University of Milan and Pavia. In 2015, he enrolled for a PhD program with a focus on literature, art, and environmental heritage at the University of Milan.

The Celestial Axis in Manilius' *Astronomica* (1. 275-293): Paradox and Sublime

Like Aratus and the Latin translators (Cicero and Germanicus), Manilius begins the first book of *Astronomica* by describing the northern constellations as a didactic exposition on the celestial axis: the imaginary line that connects the North Pole to the South Pole. The axis in Manilius' astronomy plays a remarkable role: it is responsible for the world's perpetual and orderly rotation, which in the Stoic philosophical background of the poem, is an evident manifestation of the rational divinity in nature. This is why the poet doesn't allegorize, like Vergil or Ovid, Atlas as Axis, but traces a brief description of the two-sphere cosmos. In the passage, the importance of this astronomical object is underlined by the recourse to a rhetoric of the paradox (a), and to a sublime (b). (a) Two basic concepts are repeated in the explanation: the axis' immateriality, and its fixed and static position in the sky. The poet, throughout the exposition, stresses the antithesis between the axis, static and immaterial, and the world, perpetually

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moving and material. This opposition creates a paradoxical effect: the static axis allows the cosmos to rotate and, despite its immateriality, is able to support the entire weight of the world. (b) Manilius, representing the whirling cosmic movement and using a cosmological and poetical language, depicts a world characterized by a sublime Grandeur. In particular, the recourse to the concept of the void, an element apparently extraneous to the Manilian cosmology, creates a “sublime imaginary”. The sublime that Manilius has inherited from his predecessor Lucretius, seems to be an instrument through which the poet carries the reader before the greatness of the cosmos.

The paper intends to illustrate the cosmological and poetical importance of the Axis’ description, moving from the most recent studies on Manilius, which have surprisingly neglected the passage. This contribution, examining the rhetoric of paradox and the sublime, observes the manners through which didactic poetry attempts to visualize and describe an invisible object like the axis in the context of Manilius’ *Astronomica*. Through a textual and linguistic analysis, the paper shows how Manilius uses and increases the expressive and rhetorical tools of the Greek and Latin didactic poetry in order to produce a poetical work that could represent and hence recreate the world in the text, even in its invisible components.

Martin Streicher, *Rheinische Friedrich-Wilhelms-Universität Bonn, Germany*

Martin Streicher completed his studies on Classical Antiquity at the Georg-August-Universität Göttingen in 2011 with a master’s thesis on the iconography of traditional costumes in Ancient Greece (German: *Trachtikonographie im antiken Griechenland*). Different activities within and beyond archeology as well as stays abroad followed. He is now working on his PhD thesis focusing on *Panathenäische Preisamphoren der hellenistischen Zeit* at Rheinische Friedrich-Wilhelms-Universität Bonn, where he also teaches Classical Archeology. He has published and held lectures about his research projects. Streicher is currently working on the “Lehre, Organisieren und Beraten im Hochschulbereich” project at Johannes Gutenberg-Universität Mainz.

The Panathenaic Prize-Amphorae as Communication Media for Mythological, Historical, and Cultural Knowledge

The study of ceramic-genres is of particular significance for a better understanding of ancient cultures. Ceramic-genres appeared in all areas of life, especially the Panathenaic Prize-Amphorae – produced for the state and given to the winner of hippic, gymnastic, and artistic competitions (*agones*). The iconography of the vase shows the goddess Athena on the front and an athletic competition (for example chariot races, running, or boxing) on the back. Optionally, elements like *nikes*, pillar-figures and judges complement the scheme. The officials who organized the festival were mentioned in the inscriptions on the vase from as early as the 4th century BC.

After the Prize-Amphorae were presented as awards, they spread all over the Mediterranean by means of economic and social networks and were embedded in sepulchers, sacral and profane contexts for secondary use. From the winners of the competition to the visitors of the

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sanctuary, in which a Prize-Amphorae was shown, one can determine heterogeneous groups of addressees. The reception of the vase-pictures depends on the context of its use as well as public accessibility. The adaption of the vase form, the iconography by different media (such as coins, paintings, mosaics, marble), and the production of local copies show the popularity of Prize-Amphorae. In these cases, the original inscriptions were dropped, resulting in the loss of the reference to the historical identity and year of the competition. The reception was limited to abstract, adaptable elements of the iconography whereas the historical references were not important anymore.

Besides the dimensions of content, the choice of medium and technique is also important to understand the process of communication and reception. The Prize-Amphorae are the only vase genre which were produced in black-figure technique for six centuries. The technical aspect was an integral part of the communication. The choice of this traditional technique, which was perfected in Athens, wasn't without any cause and was rather linked with the content communicated through vase form and iconography. The lectures aim to analyze the Panathenaic Prize-Amphorae as a medium used to communicate central cultural elements of the Greek culture to a large number of recipients in an understandable way. The focus will be on visual and written elements of the painting, which include mythological (Athena and Nike), historical (persons and Panathenaic Games), and sociocultural (athletics and agonistic) aspects. This vase genre, produced for the state and spread all over the Mediterranean, is suitable for investigating the spreading mechanism of ancient knowledge.

ON THE TRAIL OF POPULAR SCIENCE IN ANTIQUITY III

Prof. Dr. María J. Martín-Velasco, *Universidade de Santiago de Compostela, Spain*

Prof. Dr. Maria J. Martín-Velasco studied Classical Philology at the University of Santiago de Compostela (Galicia, Spain). After completing her studies, she worked for 16 years as a high school teacher, helping her students to prepare for entrance exams to study humanities and organizing European exchange programs until she returned to research and continued her career as a scientist at the University of Santiago de Compostela in 1997. Her special research areas include Ancient Greek oratory, Rhetoric, Ancient Greek Law, Political Philosophy, Linguistics, Ancient religion, Greek prose (specially historiography), and Greek syntax.

(Popular) Scientific Knowledge and its Rhetorical Use in Aristotle

The controversy over the extent to which Aristotle truthfully transmitted the (popular) scientific thought of his predecessors was initiated by Cherniss (1957: 104-114 and 1991: 10-13) and followed by McDiarmid (1970: 178-238). They claimed that Aristotle was not interested in making a reliable exposition of his predecessor's ideas but only in showing the extent to which those theories fit his way of understanding the cosmos. According to them, Aristotle did not hesitate to distort his predecessors' statements and draw certain conclusions that probably

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did not result from his predecessors. Guthrie (1970: 240), on the contrary, defends the intellectual honesty of Aristotle who, in his view, makes an exposition of the views of his predecessors to avoid falling into an unnecessary or arbitrary repetition. He carefully distinguishes between their own conjectures and the doctrines of nature scientists before him. By incorporating the judgments of the ancients into his own discourse, he consequently had to translate the questions posed by them into his own vocabulary and his own way of reasoning, but this does not necessarily imply, as Cherniss (1935) affirmed, that he situates himself in a plane of superiority. He does not refute them or manipulate them to seek support for their own theories. Our goal in this paper is to study how Aristotle includes these historical expositions in his treatises of metaphysics, cosmology, as well as human and natural sciences by means of “popular” scientific methods such as dialectic argumentation, principle of generalization, or enthymeme, i.e. a truncated syllogism based on probability, without explicit premises.

One instance is where Aristotle makes use of the theory of opposites developed by his ancestors (Lloyd 1987: 23). In *Physics* 188b, 21, when considering the problem of ἀρχαί and their role in the change, after exposing the theory of opposites of his predecessors, he himself shapes a theory in the same sense, proposing the *Form* (εἶδος or μορφή) and the *Deprivation* (στέρησις) as the opposite principles. Taking it as a starting point, he develops a whole theory that, in many cases, lacks an empirical foundation and which he also extrapolates to the moral and religious sphere, as reflected in the data provided in the Pythagorean table in *Metaph.* 986a22.

With Aristotle, the ἔνδοξα, the opinions of the experts have the same function that could be given to direct historical research or to the process of observation and verification of data. Aristotle considers them the starting point from which the theoretical conceptions must be based, following a suitable method to each type of science. In the case of natural sciences, they serve as a generalizing principle from which a universal and necessary law is extracted by causal inference and then applied to particular cases. In the case of human sciences, a different method must be used. Human actions move in the field of practical reason, φρόνησις, in which the need has no place, because each human act is always the product of a free decision and thus, as he explains in *Metaph.* 981a1-24, is not susceptible to entering into a causal relationship (Bueno 1980: 95). As a result, the historical data can only be used to establish a principle of generalization (τὸ ὡς ἐπὶ τὸ πολὺ) or as a premise of the enthymeme.

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Maurice Parussel, Ruhr-Universität Bochum, Germany

After finishing his studies on History and Classical Philology with a Master of Arts, Maurice Parussel works as a research assistant at the University of Bochum, where he is currently pursuing his PhD at the Department of Classical Philology. As part of his PhD program, Parussel is also involved in the DFG-project “Der Christus patiens und die Poiesis griechischer Cento-Dichtungen”.

**Popular Scientific Argument Schemes in the Second Sophistry –
The Case Study of the *Apologia* of Apuleius of Madaura**

Within the objective of a comprehensive discussion of the genealogy of popular science, one needs to pay attention to particularly early forms of this social phenomenon. Even though numerous highly heterogeneous forms of expression of popular science can be identified in antiquity, the intellectual current of the so-called “Second Sophistic” offers a particularly broad field for examining the performance and mechanism of popular science. Thus, for the first time in the history of the Mediterranean, scholars of the Second Sophistic benefited from a comprehensive network of all of the intellectual centres of the known world back, and complete access to the literary records of the Greco-Roman culture. This was warranted by the transcultural region of the Roman Empire at the height of its power. Additionally, the tremendous widespread impact the representatives of the Second Sophistic had in the second and third century can also be explained through the development of potential beneficiaries in the cities of the Roman Empire. These beneficiaries had the potential to become addressees of supra-regional disseminated forms of popular science due to the increased transfer of knowledge. Taking into account this intellectual and cultural background, this lecture focuses on the *Apologia* of Apuleius of Madaura, which was used as a defence for the unauthorized use of magic before court in 158. The speech can be primarily viewed as an impressive testimony of Second Sophistic rhetoric, and an important source for the discussion on earlier forms of popular science. Thus, in his speech, Apuleius presents himself less as a defendant, anxious to save his life, and more as a scholar who shares his extensive knowledge on the subject of magic and the associated subjects, such as philosophy, religion or literature with the court, the plaintiff and the audience. Apuleius’ statements vary between well-founded scientific explanations, such as his report on animal species; “sophisticated” wit, such as the rejection of the charges on the basis that anyone who truly believes a man to be a magician would ever sue this man out of fear; and popular science approaches in which Apuleius strives to break down more complex scientific facts to make them comprehensible at a lower level, while trying to make sure that the content of his explanations can be accepted as the unadulterated truth are at an audience level. Apuleius’ notably condensed argumentation schemes of popular science, which he worded simply for the benefit of the audience which is the main target of his speech, are mostly substantiated by quotes from various literary genres. Included in these are his extended and simplified explanations for epilepsy supported by Plato references, which serves as a vivid example. Based on this, this lecture primarily aims to show the devices used in *Apologia*’s numerous attempts to explain popular science, in order to, secondly, illustrate the historical continuity of the popular scientific approach found in this speech.

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Sara Matías Pérez, *Universidad de Salamanca, Spain*

Sara Matías Pérez graduated in Classical Philology at the University of Santiago de Compostela and obtained a Mater degree in Classics at the University of Salamanca in 2017, where she is now working on her PhD thesis.

Ekphrasis as Device for Knowledge Dissemination in Euripides

Ekphrasis is one of the rhetorical exercises (progymnasmata) in Antiquity, the vivid description of persons, facts, places, times, and many other things. Although the definition of ekphrasis appears for the first time in the Progymnasmata of the Second Sophistic (s. I AD and later), there is evidence for its practice from as early as the classical period and before. This is the basis on which my paper aims to analyze the euripidean ekphrastic device from the perspective of knowledge dissemination and make an approximation to the development of ekphrastic passages in euripidean tragedy. In view of previous rhetorical studies on ekphrasis and the data the progymnasmata gave to us, we will be able to clarify the importance of ekphrasis in a technical-rhetorical sense, as a stylistic aspect of literary texts. In order to do that, we will formulate some questions that have emerged but not yet resolved. The main question is: which ekphrastic passages can be considered to have been a medium of historical, scientific, or mythological knowledge for the public at that time? In the light of physical evidence of other progymnasmata and in view of recent analyses that show the technical-rhetorical sense of ekphrasis in Euripides, we can infer that the Greek author was both a useful model to the rhetors of the Second Sophistic as well as a user of ekphrasis and the other rhetorical resources that were later called progymnasmata.

There are some examples of ekphrastic passages that may clarify this issue: the description of the shield of Achilles (*Electra* vv. 451-477) or the shields of Theban warriors (*Phoenissae* vv. 1106-1140). Also, the description of sculpture in the temple of Apollo (*Ion* vv. 184-218), tapestries with intra history (vv. 1122-1165), and even ritual objects (*Supplices* vv. 1197-1204). First, I will point out the character for each ekphrasis and its relation in the text. Next, I will examine these passages, paying attention to the respective descriptions, the vivid language (e.g. verbs of perception, variety of adjectives, temporal adverbs or particles), and the rhetoric elements used in each case. The description of these objects makes it possible to underline the past cultural background due to the versatile nature of ekphrasis.

In view of the above, it may be concluded that Euripides draw on a wide variety rhetoric resources in relation to other Greek tragedian authors. This is why euripidean ekphrasis is significant. On the one hand, this resource portrays a vivid presentation of an aesthetic object (e.g. description of a shield that evokes a famous mythical episode). On the other hand, the vivid descriptions in euripidean tragedy have created a way of education that provides us with important artistic, mythological, and historical knowledge. There are many examples that we can find in current literature, paintings, and even in advertisements. This shows that the inherited knowledge is still deeply rooted in our cultural values.

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Dr. Anke Walter, Newcastle University, United Kingdom

Dr. Anke Walter studied Classics at the Universities of Göttingen, Heidelberg, and Cambridge. Thereafter, she worked as a lecturer at the Universities of Heidelberg and Rostock. Since 2017, she has been working at Newcastle University. Her research interests mainly center on Latin literature, ancient epics (especially Flavian epics), and time in ancient literature (especially ancient etiology).

Moris mihi restat origo – Aetiology and Popular Science

One of the supreme linguistic tropes for expression of popular knowledge is the *aetion*: the narrative of how a given phenomenon came into being. In different cultural contexts, there seems to be an assumption that those who can explain the origin have fully understood, and possess complete knowledge of, the phenomenon in question.

Why could this be so, and what makes *aetia* such privileged sites for the dissemination of knowledge – both ‘pseudo’- and ‘actual’ knowledge, or of truths, lies, and anything in between? This has to do with their respective rhetoric: implicitly or explicitly, *aetia* are always structured around the identity between a past and a present state of affairs. The fact that a certain phenomenon lives on in the present – under the very eyes of the audience – allegedly ‘proves’ that the account of how this state of affairs came into being must be true.

The specific potential of *aetia* to powerfully – and memorably – convey both ‘true’ and ‘false’ knowledge has been exploited in both scientific and non-scientific texts and contexts from antiquity to the present day. This trope is especially at home in the history of religion and the explanation of cults and rituals. One ancient text that self-consciously explores the functioning of religious *aetia* in a literary context is Ovid’s *Fasti*: a poem on the Roman calendar and the origin and meaning of its individual days and festivals. In one rather long section on the origin of a rite celebrated in honor of the rustic goddess Pales, Ovid presents no less than nine different explanations. If one reads carefully, Ovid also suggests that none of them can be true. But still, this chain of *aetia* fulfils an important function. It associates the ritual with a very long history, ranging back to the creation of the world. Together, these *aetia* provide a telling context for yet another story of origin: the foundation of the city of Rome. The dating of Rome’s foundation is said to be a conscious decision, which exploits – or, at any rate, profits from – the wealth of associations triggered by the numerous *aetia* listed immediately before. Well beyond questions of truth or falsehoods, *aetia* powerfully convey different layers of meaning, blurring the boundary between solid knowledge and less fact-based, more ideologically driven messages.

Ovid, then, masterfully exposes the way *aetia* inextricably intertwine literature and knowledge. If we compare the techniques highlighted by Ovid with modern examples, we see that the same basic phenomena still apply today. For instance, popularizing modern accounts of scientific or technological inventions, such as the invention of the telephone, carries hidden messages celebrating the cult of the genius, the infinite power of technology, and constant technological progress that keeps improving the human condition and creating a more hu-

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mane world. The powerful rhetoric device of the *aetion*, in both scientific and non-scientific contexts, requires sophisticated, critical readers to keep track of the intricate way *aetia* disseminate ideologies, science, and knowledge in an alluring rhetorical guise.

BETWEEN ANTIQUITY AND MODERNITY

Prof. Dr. Mathias Herweg, *Karlsruhe Institute of Technology*

Mathias Herweg studied German Studies, History and Social Studies at the Julius Maximilian University of Würzburg. Between 1998 – 2001 he worked as a Research Fellow on the DFG research project entitled “Das Bild des Krieges im Wandel vom Mittelalter zur Frühen Neuzeit” (“The Image of War from the Middle Ages to Early Modernity”). In 2001 he received his doctorate following his dissertation on the German Historical Poetry of the Middle Ages. In 2007 he obtained his postdoctoral lecture qualification, following the publication of his book entitled *Paths to Commitment: Studies of the German Novel around 1300*. Between 2007 and 2010, he worked as substitute professor for several universities including the University of Karlsruhe and Heidelberg, and was called to Leipzig, Heidelberg, and Karlsruhe on several occasions. Mathias has been Professor of Medieval German Studies and Early Modern Studies at KIT since 2010. His research interests include: poetics of the pre-modern novel, Old High German language and literature, encyclopaedic narrative, narratology, fictionality and factuality, chronology, and German literature in European references.

Knowledge Order and Knowledge Popularization: Constants
and Changes in the Pre-Modern Encyclopaedism

Encyclopaedias are amongst the oldest form of media for organizing and popularizing knowledge as they break down complex expert knowledge into “conversational knowledge” for the general public (see concept of ‘conversational lexicon’). They reflect both the identity and self-awareness of their respective culture and era. This lecture seeks to shed light on the evolution of the genre in its cultural and media change up to the brink of modernity: from the ancient beginnings of Pliny to the medieval ‘golden age’ of the genre in the 13th century, up to the epistemological revolutions in early modernism which accompanied the change from the written word to the printed word. This lecture also focuses on the change of the organization of categories of knowledge. A circle, a tree, a treasure trove of knowledge, a mirror, an image, a circle and world theatre: these images evoke the titles of early encyclopaedias which categorized knowledge depending on subjects or discipline, rather than alphabetically. Seeing as, from the time of Antiquity, encyclopaedias portray a close interaction of text and image, this lecture will present a rich panorama of images from a single genre, spanning over 1500 years. This genre has shaped knowledge and education throughout these 1500 years like no other, and we are reminded of its media origins through the present day influence of Wikipedia, among others.

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Prof. Dr. Marion Gindhart, *Johannes Gutenberg-Universität Mainz, Germany*

Marion Gindhart is a supernumerary professor at the Johannes Gutenberg University Mainz. Since 2013, she has been co-initiator of the DFG Research Training Group "Frühe Konzepte von Mensch und Natur" (Latin Studies). From 2010-2016, she was a junior professor in Mainz where she represented the "Paradigma Alte Welt" field of work at the Institute for Ancient History. She has been involved with the "Opera Camerarii. Eine semantische Datenbank zu den gedruckten Werken von Joachim Camerarius d.Ä. (1500-1574)" DFG project at the Julius-Maximilians-Universität Würzburg since 2017. Her areas of research include ancient and early modern knowledge, natural phenomena in their discursive formations, early modern history of disputes and translations of antiquities, and historical narratology.

Was Cometen eygentlich seyen – About the Transfer of Naturalistic Knowledge in the Ephemeral Cometary Literature (Keynote)

In this lecture I would like to show which fields of knowledge materialize in early modern journalism, how natural approaches to comets are formed, and the strategies that convey this comet knowledge to different groups of recipients in various formats.

Interesting examples include popular media such as (printed) sermons on comets, which also debate (especially traditional) natural history knowledge, or prognostic texts, which – as in the case of Peter Apian – can convey new scientific findings (tail direction law) and mathematic calculations with strong image support. In addition, bilingual treatises are taken into consideration such as *Uranodromus Cometicus* by Peter Crüger, which offers Latin passages for the specialists (e.g., about parallax settings) and summarizes the results in vernacular language.

PD Dr. Markus Sehlmeier, *Universität Osnabrück, Germany*

PD Dr. Markus Sehlmeier studied History and Latin to become a teacher in Göttingen and Rostock. He worked as a research associate and lecturer at the Universities of Rostock, Bielefeld, Marburg, Osnabrück, and Hildesheim. In his dissertation, he dealt with "Roman City Statues of the Republican Period". His Habilitation was titled "Historical Images in Transition from Pagan to Christian Empire".

More Publicity through very Short Books: Historical Epitomes in Late Antiquity and Renaissance

One way to make science popular is to publish very short books. Obviously, these will address a much wider public than multi-volume works. The efflorescence of such short introductions is neither all pervasive nor a sign of cultural impoverishment; condensing texts is a phenomenon in many genres (Horster / Reitz 2010), but I will concentrate on history. When we think of classical historiography, works of reference like Livy's *Ab urbe condita* or Ammian's *History* come to our minds. Published on several papyrus rolls, these expensive works had a relatively

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small audience. Historical knowledge was an important precondition for writing of speeches and was trained in progymnasmata at rhetoric schools.

In late antiquity, especially in the last half of the 4th century and the beginnings of the 5th century, shorter books on geography and history dominate. These are known as breviarum or Epitomes: Authors like Ampelius and Solinus combine cosmologic, geographic and historic basics extracted from voluminous works; Aurelius Victor and Rufius Festus wrote short histories of the Roman Empire. These works helped disseminate knowledge that was useful in applying for positions in public administration (Brown 1971; Sehlmeier 2009) and constructed a Roman world in a very simplifying way, but encouraged the reader to gain knowledge that was for a long time exclusive to graduates of Roman grammar and rhetoric schools. Some scholars link the development of the short texts to the media transformation from papyrus to codex. The efflorescence of abbreviated works was often explained by the necessity to remain Roman in a Christian world, by questions of identity, as well as the fear of Germanic invasions. They addressed not only pagans, but also the elites of the Christians, the Christian authors.

It remains to be seen whether a positive comparison between other epochs, which have a lot of abbreviated works, can be drawn. The aim of my research would be a genealogy of such short forms that are often found in renaissance. The interest in antiquity has grown since the 14th century. Bruni's *De primo bello punico*, an Epitome from the Greek Polybios, had wide impact through 146 manuscripts (existing until today) – his many works made him the "most popular author of the Quattrocento" (Hankins 1997). Other Epitomes concerned world history, e.g., Piccolomini's excerpt from Biondo's *Decades*, a history from 410 AD. Fear of Turkish or central European invasion into Italy could be one explanation for the production of the short works. Since the 1460s, printing enabled the dissemination of works in every form. Early modern popular science was founded on many new media – journals, newspapers, pamphlets, which had addressed a larger audience than the thick books often read only by scholars.

AGE OF ENLIGHTENMENT AND BEYOND: REASON AND FUN WITH NATURAL SCIENCES

Dr. Oliver Hochadel, IMF-CSIC, Barcelona (Spanish National Research Council)

Oliver Hochadel is historian of science and works as a tenured scientist at the Institució Milà i Fontanals in Barcelona, which is part of the Spanish National Research Council (CSIC, Consejo Superior de Investigaciones Científicas). He received a doctor's degree at Freiburg University (Switzerland) for a dissertation on Public Science and Electricity during the German Enlightenment that was published in 2003. His research focuses on the relationship of science and the public in general, as well as on case studies on electricity in German Enlightenment, the zoological garden in the 19th century, science and state around 1900, and the contemporary paleoanthropology.

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**From Rational Pleasure to Fun with Science. Continuities
in the History of Science Popularization since the Enlightenment** (Keynote)

Science centers, kids' university, multi-million funding programs. It seems that science communication is booming. Suddenly, new institutions and formats arise. Actually, over the last 250 years, nearly everything to do with science communication changed: status and content of science, literacy of the audience, the media of science communication and the following professional intermediaries. Right?

The lecture aims to show a different perspective than this all-new narrative. Despite obvious fundamental changes, there are striking continuities in history of science communication since the enlightenment. These include the relation between entertainment and classes, between pleasure and education, among others. The argumentation of popularizers is always the same: to awaken interest, science has to follow the existing knowledge and wishes of the addressees. This immediately raises a counter-argument: the underlying objective will be missed when science is presented too lively, when communicators focus too much on fun, effects, and visual overpowering. Those who only address the senses and the diaphragm do not reach the mind. Enlighteners once warned that though one should have pleasure, it should be in a reasonable way.

The question of function is also part of the Genealogy of Popular Science. This lecture tries to show that the popularization of science always fulfilled a legitimating function. Since the 18th century, the public community was an important resource to call attention to a controversial theory, a new discipline, or to science in general. This systematic comparing course through the history of the popularization of science is supposed to sensitize the view for the present and the future.

Prof. Dr. Verena Kuni, *Goethe Universität Frankfurt am Main, Germany*

Verena Kuni is a scholar in the field of art, cultural and media studies and professor for visual culture at Goethe University, Frankfurt Main. Her research and teaching, projects and publications focus on transfers between material and media cultures; media of imagination and technologies of transformation; DIY cultures and critical making; (in)visible gardens, biotopes and techno/nature/cultures; philosophical toys and/as tools; visual epistemology; information design and/as figurations of knowledge; alternate realities and (trans)formations of time. She has dedicated special interest to the potentials and problems of disciplinary, inter- and trans-disciplinary approaches, methods and tools, theories and practices. Among her current projects are the pictorial and imaginary space of zones of wild(er)ness, the representation and communication of (bio) diversity, as well as artistic and experimental approaches to DIYscience.

Science in the Box. History and Cultural Impact of Popular Scientific Kits

Over the past decades – and almost for a centenary – science kits have been important vehicles for popular science education. Their materiality and mediality, the development and

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transformations of specific sets and whole genres provide multiple approaches for a genealogy of popular science. They also provide valuable insights into the ways popular science relates to that which is more generally understood as science, including the symbolic practices associated with science as well as the techniques and technologies involved in the processes that are of relevance for the formation of objects and subjects of science. Related questions can be addressed not only to the assortment and the design of experiments and instructions, but also to the design of the kits in whole and in detail, in terms of objects, word(ing)s, images and imagery.

My paper will explore this complex by focusing on a cultural analysis on the impact and the transformations of popular scientific kits, by discussing selected examples from the 20th and 21st centuries, and by paying special attention to a recent development: Particularly over the past decades, members of DIY and maker communities as well as artists who are engaged in and with interdisciplinary projects located in different fields of DIY science have created their own science kits. This allows us the opportunity to take a comparative perspective in account by asking if, how, and to what extent these DIY and/or artistic science kits vary and/or differ significantly from those designed for the bigger market. Moreover, this very framework invites us to discuss how the relations between science and popular science may have changed over the past decades.

Dr. Miira Hill, *Technische Universität Berlin, Germany*

Miira Hill, Ph.D., was a doctoral candidate and postdoc at the "Innovation Society Today" graduate school at Technische Universität Berlin. She is the author of *Slamming Science. The New Art of Old Public Science Communication* (2016). Her research interest lies in the sociology of knowledge, communication research, science and technology studies, and innovation research. Her research focuses on the situated performance of scientists on stage and the justifications of their actions. She studied sociology at the University of Bielefeld and Technische Universität Berlin. She received her Ph.D. in sociology in 2016.

Innovative Popular Science Communication? Materiality's, Aesthetics, and Gender of New Science Communication in the Genre of Science Slam

New scientific events are coming up. Science Slam, the successful German event, is one of several genres that have been established in western societies since the nineties. Scientists are asked to present their topic in popular, innovative ways and address a rather rare non-academic audience. This paper is about the communicative construction (Knoblauch 1995) of science communication in this popular genre, more precisely, within the context of the materiality's, aesthetics and gender.

Feminist science studies understood the body of knowledge of the western scientist to be differentiated from the representations of women. Haraway was mistrustful about the way in which western scientists avoid positioning themselves or their responsibility regarding their research. She opposed the "invisible conspiracy of masculine scientists and philosophers" and

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the “embodied others, who are not allowed not to have a body, a finite point of view” (Haraway 1988: 575). Disembodiment and universal claims were described as part of the western scientist’s bag of “God-tricks”, which she termed a view from nowhere. In Science Slams, we can observe how popular scientists position themselves. One of the best-known performances is that of Giulia Enders, a female scientist from the discipline of medicine who became a successful science slammer and later a bestselling author. She had a great impact on the public image of science. Her case is a great example of how traditional ideas about science are challenged in Science Slam presentations. Her success was just as much a personal achievement as it was a success of novel public legitimation practices of science and unusual styles of self-presentations, science presentations, and interactional organization. Her example stirs up hope that such public science communication can be more impactful in breaking down conventions of science communication. Although seeing the success of presentations like that of Giulia Enders might lead us to hope for new norms of gender, technical jargon, and visual practices in scientific communication, these hopes are not wholly fulfilled in the Science Slam genre as I observed it. Although the technical jargon and visual practices of Science Slammers is quite different from that used in university lectures, marginalization of gender, among other groups, remains an issue.

My empirical observations (ethnography, video analysis, interviews) have shown that, even if the new Science Slam genre seems to enable all kinds of revisionist representations of science for men, women remain silent and invisible. New forms of popular scientific personas are presented to the public. The gentleman from early modern times, who was formerly the type of individual entrusted with telling the truth, has today been replaced by new types of public scientists. Drawing on typical tropes of patriarchal societies, successful Science Slams women are presented as objects of desire, hardworking assistants, or aunts, mothers, and grandmothers. In this way, the Science Slam could be understood as expression of a still-problematic gender relation in science (especially in natural, applied, formal, and health science). Further slams often include offensive and marginalizing representations of minority groups. Though this is extremely problematic, the display of such discourses on stage allows scientists to make themselves and their discursive moves available for critique, both by situated audiences, as well as by other scholars, policy makers, and members of the media.

MODERN TIMES: POPULARIZATION OF – AND THROUGH – ART

Prof. Dr. Dr. Erna Fiorentini, Karlsruhe Institute of Technology

Erna Fiorentini received two doctor's degrees at the Friedrich-Wilhelms-University Bonn, first in geochemistry and classical archeology, and then in art history. From 2003-2009, she was a research associate at the Kunsthistorisches Institut of the Freie Universität Berlin and, at the same time, an affiliated scholar at the Max Planck Institute for the History of Science in Berlin. After her habilitation in art history at the Freie Universität Berlin in 2009, she researched and taught as a Heisenberg Fellow of the Deutsche Forschungsgemeinschaft at the Institut für Kunst- und Bildgeschichte of the Humboldt-Universität zu Berlin. In 2011, 2012, and 2016, she

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was a guest scholar at the History of Art Department – Center for Visual Studies at the University of Oxford. In summer semester 2017, she was a visiting professor at the Kunsthistorisches Institut of the Freie Universität Berlin. Currently, she is a visiting professor for art history at Karlsruhe Institute of Technology. She researches historical, epistemological and aesthetic aspects of image production, focusing on the history and theory of vision and on the problems of visibility and visualization, as well as on concepts of nature and landscape and their pictorial practices, including methodological issues between visual disciplines.

Manual Skepticism vs. Market Success.

How did optical drawing aids 1800 - 1850 become popular? (Keynote)

At the beginning of the 19th century, optical aids for drawing were a topic in drawing technique manuals. These publications, which were not aimed solely at a specialist publication but were also intended for a broader range of amateurs and those with a general interest, led to an academic depreciation of the optical drawing aids, resulting in advice against their use. This skepticism is inversely proportional to the popularity of these instruments in the practice of drawing, both professionally and from a popularity perspective, which reflect the sales of these instruments. As a result, there is a blatant gap between the opinion expressed by the manuals and that of the marketplace. Moreover, if the marketing of these drawing instruments – hardly didactically, but economically intended – proceeds from the optical sciences and their fields of application, this historically limited phenomenon offers the opportunity to reflect different paths of knowledge dissemination and their respective effectiveness.

Prof. Dr. Oliver Jehle, Karlsruhe Institute of Technology

Prof. Dr. Oliver Jehle studied Art History, Modern German Literature and Medieval History at the Albert Ludwigs University of Freiburg. He received a scholarship from the University College, London and from the German Research Foundation in Frankfurt am Main and is a member of the Elitenetzwerk Bayern (Elite Network Bavaria). In 2014, he was awarded the Prize for Excellence in Teaching from the Bavarian State Ministry for Education, Culture, Science and Arts. From 2004-2005 he was Deputy Managing Director of the Collaborative Research Centre 626 “Ästhetische Erfahrung im Zeichen der Entgrenzung der Künste” (“Aesthetic Experience in the Face of the Dissolution of Boundaries in the Arts”) at the Free University of Berlin (FU). In 2005 he received his doctorate at the FU. His dissertation title was “Konturen des Mitleids. Ästhetische Erfahrung und moralisches Urteil im Zeichen der Empfindsamkeit” (“Contours of Pity: Aesthetic Experiences and Moral Judgement in the Face of Sensitivity”). In 2014, he became his postdoctoral qualification following the publication of his book entitled “Law and Sensation – Adolf Hölzel and the European Avantgarde.” That same year, he received his teaching license in the field of Art History, at the University of Regensburg. Since April 2016, Prof. Dr. Jehle has been Institute Director and Dean of the Department of Art History at the Karlsruhe Institute of Technology (KIT). His research interests include: paintings from 1500 to today, art theory and practice of the European Avant-garde, paintings and sculptures in Classicism and Romanticism, theory and practice of artistic drawings, religious and profane paintings of the Early Modern Period, art history – hermeneutics and history of knowledge.

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Clear Mirrors, Broken Pieces – Newton and the Art of Trompe-l'oeil

Count Algarotti's *Il Newtonianismo per le dame, ovvero dialoghi sopra la luce i colori* (Sir Isaac Newton's Philosophy Explained for the Use of Ladies, in Six Dialogues on Light and Colours) was known to have provided a model for a wealth of popular representations of Newton's world view. Only weeks after its publication in 1737, the publication spread rapidly beyond the city limits of Naples and was made available to a larger audience with translations into French, English, and German. The popularity of this text suggests that a broad public interest in optical phenomena already existed in the 20s and 30s of the 18th century. Knowledge of the physical conditions of light and colours had spread, and a refined culture of scientific dilettantism manifested itself – but why, and where did this knowledge circulate?

Algarotti belonged to a circle of intellectuals in Venice, which the British ambassador Smith kept in his company. In light of their increased enthusiasm for Newton, this circle of intellectuals was not only interested in the popularization of sciences, but also in the scientific emancipation of women. This explains why Algarotti more or less directly addressed an all-female general public audience. Their motto was Newton without mathematics, because they believed this was the only way to reach their new audience.

In his book *New Theory about Light and Colours*, published in 1672, the young Isaac Newton describes how his observation of light passing through a prism sparked his curiosity: this “divertissement” was “[p]leasing”, it was a pleasure that arose from seeing the previously unobserved spectacle of prismatic colours. Experiencing natural-philosophical studies in a lively, indeed intensive process, led to more than an “ordinary curiosity” from the scientist. The aim was to fuel the imagination, to be persuaded by perception. That is why the arts, which provide a stage for knowledge, are of paramount importance in the education of the general public. Newton without mathematics can easily be popularized based on artefacts, given that experimental scientific culture is founded on artefacts under the influence of visual culture, which itself was always conceived as idolatry during the Enlightenment.

The aim is to describe a refined version of Newton's vision: a distanced yet excited mode of perception, which always dares to take the step from aisthēsis to aesthetics at the convergence of artistic and scientific eye, and aesthetic fascination and curiosity. This lecture gladly demonstrates the fact that the aesthetic value of an experiment sometimes exceeds its epistemic value.

Dr. Alexandra Axtmann, Karlsruhe Institute of Technology

Dr. Alexandra Axtmann studied Art History at the University of Karlsruhe (TH) and Musicology at Karlsruhe's University of Music. End of 2005 she received her master's degree with a thesis on the architectural form of medieval reliquaries. After this, she worked as a freelance art historian at the Frieder Burda Museum in Baden-Baden, at the Baden State Museum in Karlsruhe, outpost section of the German Museum of Mechanical Musical Instruments in the Bruchsal Palace, and in the architecture faculty library at the KIT. 2008 to 2012, retro catalogu-

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ing of the entire library of the Institute for Architectural History at the KIT. 2012 PhD at KIT with a thesis on the socio-critical painter Harald Duwe (1926-1984), funded by a doctoral scholarship of the state of Baden-Württemberg. Summer 2012, permanent position as research assistant in the creative department of the Autostadt Wolfsburg (VW). Since the winter semester 2012/2013 academic assistant at the Department of Art History at KIT. 2017 Faculty Teaching Award from the Faculty of Architecture.

Wilhelm Lübke – Art History for Feuilletons

Wilhelm Lübke (1826-1893) was the third professor of art history and spent the last eight years of his life at the Karlsruhe Polytechnic, now known as the KIT. In addition to important manuals on architecture, sculpture, painting and the history of art in individual countries, some of which are still considered fundamental today, he wrote innumerable articles for daily newspapers and for art history and other bourgeois journals. A thoroughly researched bibliography explains why Lübke's contemporaries called him a "frivolous rapid writer" for good reason. For example, about 100 various contributions were recorded in the *Deutsche Kunstblatt* (German Art Journal) (published 1850-1858), and 251 contributions in the *Allgemeine Zeitung* (General Newspaper). The smaller essays, reviews and discussions of new engravings and print works, photographs and exhibitions, as well as literary works, compositions and opera performances bear witness to Lübke's interest and knowledge of the contemporary art and cultural scene and his cultural-historical approach in the tradition of his friend Jacob Burckhardt, whom he succeeded as Professor of Art History in 1861 at the Swiss Federal Polytechnic Institute in Zurich.

However, the criticism he received from his contemporaries, not only concerned the enormous amount of his publications, but also the scientific claim of his writings. Among others, he was accused of inaccuracy, superficiality and lack of depth on several occasions. However, these criticisms failed to take in to account the different types of text and contexts of reception. For example, the impressive pamphlets on Raffael (1880) and Dürer's chalcography (1882), which can be regarded as the early form of the so-called coffee table books, as well as the articles in the feuilleton of the daily newspapers, were not aimed at experts. Rather, these popular works were directed at a large circle of bourgeois. After all, in the early days of establishing art history as an academic discipline, representatives such as Lübke were often concerned with arousing the interest of a broader educated middle class, while training their knowledge of the artistic field and their own aesthetic judgment. Lübke's contribution to the art-historical heritage, the "popularization of art-historical knowledge," as formulated by Lübke's friend Theodor Fontane in his review of Lübke's history of Italian painting in 1880, remains undisputed to this day and has been acknowledged in numerous obituaries and biographies. His manuals such as *Outlines of the History of Art* (Stuttgart 1860, 11 editions and translated into four languages during his lifetime) were bestsellers in their time and part of every good private library.

This work-in-progress lecture uses a few feuilleton texts to ask what Lübke's "animated speech and style of writing" express, what rhetorical means are used, and whether there are differences in the specific readership types – newspaper vs. journal.

MODERN TIMES: VISUAL CULTURES OF SCIENCE POPULARIZATION

Dr. Matthias Bruhn, Humboldt-Universität Berlin, Germany

Matthias Bruhn studied Art History and Philosophy in Hamburg. He was a research associate at Warburg-Haus and at the Brandenburgische Technische Universität (BTU) Cottbus. He was a visiting fellow at the Clark Art Institute in Williamstown (Massachusetts), postdoctoral fellow within the framework of the Getty Grant Program, and fellow at the Akademie Schloss Solitude. Besides, he is co-founder and advisory board member of ArtHist.net. Since 2005, he heads the "Das technische Bild" research group at Humboldt-Universität Berlin and is a member of the "Bild Wissen Gestaltung. Ein interdisziplinäres Labor" Excellence Cluster. He received a deputy professorship at the Staatliche Hochschule für Gestaltung Karlsruhe during the 2016/17/18 academic years. His research focuses on art and political representation of Early Modern Times, history of the scientific images, mass-media and mass-image. He is co-editor of the "Bildwelten des Wissens" annual book.

Avant-garde Imaging (Keynote)

Scientific laboratories and operating rooms are experimental areas for both new devices and procedures. Within the costly context of medicine, it is currently easy to see how devices for everyday use are introduced, partially with the promise of improved visibility and improved opportunities for interaction or training. Due to the practical aspect of many medical tasks, equipment can also be used on a case-by-case basis and test basis, the benefits of which are promising but still unknown.

Despite their high level of sophistication, even the most specialized instruments and applications in this field also follow wider trends and developments, and benefit from existing offers and prefabricated elements and components, through the use of monitors and graphics cards, sensors, controls, and other media. This means that there is a cooperation of disciplines such as computer science, electrical engineering and mechatronics, interaction and product design or related disciplines. The construction and design methods in these disciplines influence medical perception and action on various levels, and to varying degrees.

With the help of some recent digital applications enhancing vision or helping to control action, mainly based on augmented and 3D visualizations, the aim is to analyse how certain non-medical expectations and styles can be integrated overall. This is currently under systematic examination by numerous perspectives in an interdisciplinary research project in Berlin. From a "genealogical" point of view, for example with regard to the history of technology, media and art history, there are also different origins concerning the possible precursors and prerequisites in the field of preparation and surgery, visual representation, and optical media or design.

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Beatrice Immelmann, *Universität Wien, Austria*

Beatrice Immelmann studied European art history at the universities of Heidelberg, Brussels, and Vienna. After completing her master's degree, she worked at the International Fredener Musiktage (Chamber Music Festival) for six years. In 2015, she began her doctoral studies (PhD) and joined the Institute of Art History at the University of Vienna as a research associate.

Terminology of Perceptual Psychology as Apologetic Strategy in the Artist's Manifesto?
The Case of Wassily Kandinsky

Numerous artists of the Avant-garde used the term *vibration* in their publications, in the context of a theoretic basis of abstract art. Wassily Kandinsky (1866-1944) most famously used *soul vibrations*, in order to describe the effect of the artistic devices of tone, colour and movement, and to establish a sort of communication between the artist and the observer or listener. The concept of aesthetic perception and experience through *nerve or soul vibrations* dates back to the 18th century and presents a recourse back to an originally natural scientific concept of sensory perception. Physical phenomena such as light and sound, and their perception, were derived from properties of the *vibrational movements* of matter (for example, from Isaac Newton). Since the first half of the 18th century, art theory and aesthetic publications have increasingly resorted to natural scientific testimonies of processes of perception or perceptual psychology (such as Edmund Burke and Charles Baudelaire).

Kandinsky is also part of this discourse, using a terminology derived from scientific and esoteric literature. I would like to discuss the reasons for the use and spread of perceptual psychology, (popular) scientific terminology through artists of the Avant-garde, and specifically reflect to what extent the recourse to (popular) scientific literature should be interpreted as an apologetic strategy. The focus here lies on Wassily Kandinsky's manifesto *Concerning the Spiritual in Art*. I generally define this terminology as a genealogical argumentation model of aesthetics and art theory. However, in the late 19th and early 20th centuries, this discourse gained a stronger presence and an additional dimension. Kandinsky specifically refers to *vibrations*, in order to convince the audience (and thus also critics) of the necessity or even the superiority of an increasingly abstract vocabulary of stylistic devices.

With numerous publications, Kandinsky also contributes to the popularisation of this terminology and *produces* an easily understandable metaphor for the description of the effect of works of art. Accordingly, the term also rapidly found its way into comments on Kandinsky's work. Hugo Ball, a co-founder of the Dada movement, describes his impressions in a lecture on Kandinsky in 1917 as follows: "The theory of electrons brought a strange vibration in all surfaces, lines, shapes. The objects changed their shape, their weight, their contrast and superimposition. Just like spirits in philosophy, the bodies were liberated from illusion in the physical realm. The dimensions grew, the boundaries fell."

I would like to analyse this recourse to terminology of perceptual psychology in terms of the appropriation and mediation of popular scientific content. Following the positioning of *popu-*

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lar science within the field of science and esoterism around 1900, this lecture will focus on the appropriation of science, esoterism and popular science in Kandinsky publications. Furthermore, I will discuss to which extent the works of the Avant-garde also led to a popularization and dissemination of knowledge.

NEW AND OLD STRATEGIES OF SCIENCE POPULARIZATION I

Lars F. Köppen, *Stiftung Historische Museen Hamburg, Germany*

Lars Frederik Köppen studied History, Islamic Studies and Agricultural Science at Martin-Luther-Universität Halle-Wittenberg from 2009 to 2017, earning an M.A. Degree in History with a study on the role of socialist brigades (Brigaden der sozialistischen Arbeit) as executive institutions for social control and workplace discipline in GDR factories. He is currently a junior research assistant at the Stiftung Historische Museen Hamburg (SHMH).

From “The Destroyer of Worlds” to “Atoms for Peace” and Back – Discourse on Nuclear Power in US Popular Science Journals during the Cold War Era

As observed since the discovery of fire by mankind and mostly in the 20th century, no source of energy has been as controversial as nuclear power. It is therefore somewhat surprising that its military and civil use have been broadly described and researched by historians, while its discussion by the public, apart from the anti-nuclear power and anti-war movement, has not. This paper aims to fill some of these blanks by analyzing the discourse on nuclear power in long-established popular science magazines such as “Popular Mechanics” and “Popular Science”. As popular science magazines, they acted as a mediator between professional engineers, researchers and the results of their work, and the interests of their layman audience that had an interest in science. They also served as a platform for both discourse among members of their audience and opinion pieces by prominent members of the scientific community like Edward Teller, Wernher von Braun or Ernest Rutherford. The analysis starts with 1945, when the nuclear attacks on Hiroshima and Nagasaki ended the secrecy about nuclear technology and made it a topic of popular interest, focusing on the discourse of the 40’s and 50’s, and it concludes with the early 1960’s, when the “Atoms for Peace” campaign and the Cuba crisis coincided.

The emphasis of this work lies on the ways that these magazines navigated between the expectations of their audience, their self-declared journalistic mission of covering innovation in science and engineering and the general political and ideological framework of their time. It will fathom the development of the magazines’ stances on nuclear power from technological euphoria in the 1940’s and 50’s, skepticism in the 1960’s and explore whether this development contrasted to or aligned with the discourse among their audiences and within the scientific communities of the time. Furthermore, the paper will discuss how the magazines in question drew, toed and in various cases, outrightly ignored the line between scientific sensation-

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alism and up-to-date journalism. Finally, a short outlook will be given on the further development of popular science magazines' views on nuclear power.

As of now, the study relies mostly on the published issues of magazines with a broader range of scientific topics like "Popular Science" and "Popular Mechanics", as well as those with a specific interest in nuclear power, e.g., the "Bulletin of the Atomic Scientists". Apart from that, material from diverse sources is employed, aiming to contextualize the views of the aforementioned magazines within domestic and worldwide debates on nuclear power at the time. However, material that documents processes of the magazines agenda setting concerning the content of then upcoming issues (such as internal memos, editor meeting protocols or unpublished articles and letters to the editor) has, until now, proven quite difficult to find.

Dirk Hommrich, Karlsruhe Institute of Technology

Dirk Hommrich studied Philosophy, Sociology, and Political Science at the universities of Karlsruhe (TH) and Frankfurt a.M.; Scholarship of DFG-Graduiertenkolleg *Topologie der Technik* at TU Darmstadt; international PhD at the department for Philosophy at TU Darmstadt; research period of several months at *Science & Technology Studies Program*, UC Davis, research assistant at Fachbereich Translations-, Sprach- und Kulturwissenschaft (FTSK), Universität Mainz, and at the department of Humanities and Social Science, HSU Hamburg; since 2017, Hommrich has been a senior researcher at the Institute for Technology Assessment and Systems Analysis (ISAS), Karlsruhe Institute of Technology (KIT) and part of the directorate of the Institute for the Study of Culture Heidelberg.

Theatrum cerebri: Gehirn & Geist and the Visual Culture of Popular Neuroscience

This lecture addresses the public media's portrayal of neuroscience against the background of visual culture and identifies the "image of the brain" as often advocated in science and technology studies which accompany neuroscientific research, in favour of a less scientific understanding of the public perception of neuroscience. To this end, this lecture uses the newspaper *Gehirn & Geist (G&G – Brain & Spirit)* as an example and argues that, the visual diversity "of" contemporary scientific journalism speaks in favour of emphasizing the relevance of the existing wealth of images for public portrayals of neuroscience – and of a possible genealogy of "popular science" and theoretical concepts. This "eye opening" moment provided by *G&G's* diversity of images, allows us to establish a secondary, yet independent, area of mediatization and social contextualisation of neuroscience and neuropsychology.

The lecture is split into three parts: taking into consideration the fact that the visual artefacts of the functional imaging of the brain plays a central role for public awareness, the first part focuses on the mediatization of neuroscience, in order to briefly shed light on the origins of "popular neuroscience". Popular presented neuroscience produces a serial media phenomenon, generating public awareness using visual and inter pictorial means. It reproduces itself via a rhetorical interlacing of scientificness with everyday life. As scientificness' cipher can be un-

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derstood the “obvious image of the brain”, as everyday life’s cipher can be seen representative “social” and “pop cultural” images.

The hypothesis in the first part of the lecture is therefore: not only are scientific data images pivotal in generating public awareness for neuroscience, but so are “non-scientific” images. Digital images of the brain (and scientific visualisations in general) are more embedded in a variety of “ordinary” standard images. Accordingly, the related rhetorical impact of visual artefacts of brain imaging is displayed particularly well *in* a hybrid visual culture of neuroscience, in contrast *to* the variety of images within public media discourse on neuroscience (and psychology).

The second part of the lecture explains that knowledge is processed through scientific journals treatment of references to everyday life and practical references. The “popular neuroscience” media phenomenon is created by the transformation of expert, or rather, neuroscientific knowledge. The main characteristic of this area of media transformation, so this hypothesis goes, consists in the integration of a “true to life” language and imagery. The sample used here is the magazine *Gehirn & Geist* (G&G, 2002-2015), which can be viewed as “gatekeeper” of a popular neuroscience. We will briefly review the general characteristics of the magazine, its structure, the large spectrum of topics and the (“converging”) media channels. Furthermore, central strategies of discourse will be described in order to establish a proximity with the audience and relevance to everyday life.

The third part of this lecture briefly shows the variety of images in G&G, in the sense of a visual culture of “popular neuroscience.” Attention will be drawn to the use of scientific *and* pseudoscientific images of the brain in its appearance, as well as the advertising measures of the magazine. After this, we will delve into the “everyday life images” with which “neuroscientific topics” are drawn attention to.

Finally, the spectrum of visual culture of popular neuroscience, which has by no means been exhausted, will be placed into a larger context for the purpose of theorisation and conceptualisation of contemporary popular science, which is part of a general economy of awareness.

NEW – AND OLD – STRATEGIES OF SCIENCE POPULARIZATION II

Dr. des. Kathrin Klohs, Universität Basel, Switzerland

Kathrin Klohs, Dr. des. Magistra Artium with first state examination in History of Contemporary German Literature, German and Philosophy, and Ethic at the University of Freiburg im Breisgau (i.Br.). She also holds a “Diploma Supplement” and a PhD in Science Studies from the University of Basel. She was a stipendiary scholar of the Landesgraduiertenförderung Baden-Wuerttemberg and of the Freiwilligen Akademischen Gesellschaft Basel. She has worked at the Universities of Freiburg i.Br., Basel and Lucerne, and at Fachhochschule Nordwestschweiz.

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Her research focuses on Science Studies and Fiction, popular media in the 20th and 21st century, narration and governmentality, guidebook and consulting firm, and Swiss contemporary prose.

Schools of Vision: Popularizations of Scientific and Scientific Research Knowledge in Movies and Comics

What do popular media like movies and comics communicate about science – and how? That's the question that this lecture aims to address, referring to theories and methods of *Film Studies* and *Comic Studies* – two disciplines which are rarely featured in Science Studies. The material won't be reviewed through sociological approaches but rather in a science-based, humanistic and cultural way. The attention will be centered on decisions pertaining to the design of speech and image – like camera perspectives or splits of on-screen space. We shall use selected, 21st-century fictional stories that focus on science as a basis to address two aspects.

The first is the popularization of scientific ways of thinking: Graphic Novels like *Feynman, Suspended in Language* or *Logicomix* and biopics like *A Beautiful Mind* or *The Theory of Everything* tell about life and thinking of single researcher and are on the boundary between fiction and facts. They use the specific means of the chosen medium to visualize scientific content. The result is a well-understandable image of the complex thinking of the protagonist: the comic hereby uses sound words, speech- and thinking bubbles, reduction and omission; the movie uses special tracking shots, depth of field or light and shadow.

The second is the popularization of scientific behavior: popular stories – among them comics and blockbuster like *The Hulk* or *Iron Man* – rely on a wide previous understanding of scientific everyday actions. The way of improvising in the laboratory or the understanding of details of an eyepiece by the protagonist and audience is an essential part of the plot. Images which were produced through scientific imaging processes appear between movie images or comic panels and integrated as paintings. But one cannot expect the same practice from the reading and cinema audience that has a scientific interest as from the members of the *community*. It is therefore proposed that the modern scientific view be understood as a widespread and culture technique.

The planned contribution thus fits into the theme of the conference, not only through the inclusion of two language- and image-based media and two disciplines dealing with them, but also through the interplay of knowledge from individual sciences and scientific research.

Elin Manker, *Universitet Stockholms, Sweden*

Elin Manker studied art history, visual arts and design and art science at the Universities of Södertörn, Konstfack and Stockholm. She has worked at several museums, as a teacher of design and fine arts and as a lecturer at the University of Örebro. She is currently pursuing a doctorate in art history at the University of Stockholm.

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Popular Aesthetics of the 19th Century – A Concurrent Story to the History of Design, Investigated Through an Analysis of Illustrations in the Periodical Press

When Carl Lemcke published *Populäre Aesthetik* in 1865, it was one of several contributions to a Western European movement informing manufacturers and people of aesthetic knowledge, with the intention to improve the emerging industrial businesses and the consumer society. It was also an outcome of the contemporaneous undertaking of transference of academic knowledge in general to a wider audience, through the genre of popular science. In the field of Art and Design History, these kinds of writings are rarely investigated, yet they served as a vital part of the formation of manufacturing and design businesses in the early years.

This paper aims to contribute to the genealogy of popular science by presenting my understanding of Lemcke's concept and how it is related to the wider context of popularized science, as well as how it interacted with periodicals dealing with manufacturing and design in the 1870s in Sweden. To do this, I will share the results from a case study within my PhD project (that concerns design criticism and design practice in Sweden 1860 – 1890). The case study elaborates the concept of popular aesthetics as the discourse where it became possible for engineering press and women's journals to enter the field of design, and where the field of design was introduced as a phenomenon for a general public. At core, it is suggested, where illustrations, used as aesthetic argument in themselves.

My study uses contemporary theoretical approaches of materiality, agency and heterogeneity as pronounced for instance by Bruno Latour and John Law to map out relations and networking within the popular press. It elaborates the idea of 'travelling concepts' as developed by cultural theorist Mieke Bal to trace how the notion of popular aesthetics, as well as illustrations understood as aesthetic statements of their own, was transferred, or migrated on an international publication arena as is pronounced here. Furthermore, as suggested by design historians Grace Lees-Maffei, design is understood as an intermingling process between production, consumption and mediation.

Lena Trüper, *Goethe-Universität Frankfurt, Germany*

Lena Trüper (*1989) is art historian and lives in Frankfurt a.M. Her research focuses on visual heritage in art and popular culture. In 2017, she completed her studies with her thesis "Im Aquarium der Kybernetik. Über Naturmetaphern des Cyberspace in der Medienkunst der 1990er Jahre am Beispiel von Char Davies *Osmose* (1995)". She plans to pursue her PhD with the working title "Geschichte und medienpolitische Implikationen visueller Naturmetaphern des Digitalen in der Kulturgeschichte der Kybernetik".

History and Media Political Implications
of Visual Metaphors for Nature in the Cybernetics of Digital Culture

The history of reception of cybernetics is a paradigmatic example for the popular scientific dissemination of a mathematical theory. While cybernetics significantly contributed to the

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development of computers on a technical level after the Second World War, its interdisciplinary reception triggered a scientific paradigm shift. This not only led to the creation of a new human concept, but also led to change in how we defined “nature”. According to this, humans were no longer outside observers of nature, which they needed to control. In the definition of the cybernetic system, humans became part of a self-organised ecosystem in which humans, electronic artefacts and biologic organisms were equally included.

The aim of my research project is to examine in which visual forms the scientific paradigm shift manifested itself and was ultimately made plausible to the public. I support the theory, that the entire cultural history of cybernetics was accompanied by visual metaphors for nature which can be traced up to the current digital culture. Included in this are images of complex natural phenomena which illustrate social relationships without exemplary representations of these.

Three essential function of visual metaphors of nature can be distinguished: firstly, these metaphors helped to make the change in definition of nature, which took place during the reflexive phase of cybernetics (1960-1980), comprehensible to a broader audience. Secondly, visual metaphors often stood for the utopia of a social “ecosystem” which emerged from the reception of cybernetic thought in the US counterculture of the 60’s and the digital utopias of cyberspace in the 90s. Thirdly, they acted as metaphors for interactive functions of visual perception itself, within art and experimental movies, through which the observer and work merge into a single creative system.

This lecture follows the change of visual metaphors for nature in cybernetics through examples take from art and popular culture in the 1950s up to cyberculture of the 1990s, and discusses their media-political implications for the present. Visual examples from the educational movie *A COMMUNICATIONS PRIMER* (Charles and Ray Eames, 1953), the so-called Pepsi pavilion of 1967 of the artists organization E.A.T (Experiments in Art and Technology), and Char Davies’ virtual room “osmosis” (1995) will be discussed, among others. The lecture is a presentation of my dissertation project (working title: “History and Media Political Implications of Visual Metaphors for Nature in the Cybernetics of Digital Culture”).

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ego apis Matinae
more modoque
grata carpentis thyma per laborem
plurimum circa nemus uvidique
Tiburis ripas operosa parvos
carmina fingo

“I, like Matine bee,
in act and guise,
that culls its sweets through toilsome hours,
am roaming Tibur’s banks along,
and fashioning with puny powers
a laboured song.”

Horace, *Carmina* IV, 2, 27-32
Translation by John Conington



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