An Interdisciplinary Laboratory Cluster of Excellence of Humboldt-Universität zu Berlin

Image Knowledge Gestaltung

Newsletter May 2014 #3

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Editorial

Photo: Claudia Lamas Cornejo | BWG 2014

Dear Readers,

Questions relating to the properties of images are a recurring theme throughout this third issue of the Cluster of Excellence's magazine. Frieder Nake in his article »Surface & Subface« deals with a new kind of image that we look at daily on computer screens and in the form of ads on mobiles and smartphones and a growing number of other semiotic devices. The way in which these new pointing, depicting, imparting agglomerations of the visible differ from the images with which we are familiar indicates visible and invisible image properties.

Franziska Kunze, whose research subject is the collodium-wet plate process, deliberately focuses on the visible elements in photographs without leaving out the photographic production process or the material properties of the image layer and the support that often find their way into the picture in this process. Investigating images for their guiding properties is part of the research work of the »Image Guidance« base project with special reference to how new procedures and empirical values result from between circuiting the image medium and the operation.

The »GiantCicada« project, led by Hannelore Hoch, Professor of Systematic Zoology at the Museum für Naturkunde, and Oliver Thie of the Berlin Weissensee School of Art, combines the discoveries made by an unprejudiced lay view, but a precise one, with the specialist's expert knowledge. The aim is to develop a joint description that illustrates the cicada's characteristic features. This ability to reconstruct is a major advantage of drawing compared with other imaging processes such as photography.

In this issue we present the new series of interviews from the *Interdisciplinary Laboratory* headlined »In Conversation with...«. Subjects dealt with are the »*Structure – Tissue – Surface« lecture series* that will continue at fortnightly intervals until mid-July, the *Cluster Library* and the *3D Mimicry Archive*. The latter was unveiled to the general public for the first time last Sartuday as part of the *Long Night of Science 2014*. We also include impressions of the event.

The next *Image Knowledge Gestaltung* newsletter will be published in the autumn of 2014.

We hope you find this newsletter to be informative and entertaining reading.

Claudia Lamas Cornejo
Head of Public Relations & Fundraising

From the Day's Work at the Lab

Photo Spread – New Crabs for Biology

Gerhard Scholtz presents one of the *Paromola cuvrie* deep-sea crabs that live at a depth of about 1,000 metres. The crabs are from the Mediterranean near Valencia and were caught by the organisation »Peces del Mediterraneo«.

Left: Morphological work is also under way on the shame-faced crab (*Calappa granulata*). Right: PhD students Katja Jaszkowiak and Catarina Bissis filling a basin with salt water for the deep-sea crabs. (Photos: Claudia Lamas Cornejo | BWG 2014)

The *LunchTalk* in the *Interdisciplinary Laboratory*

The *LunchTalk* in the *Interdisciplinary Laboratory* is held weekly from 12.30 to 2 pm on Tuesdays. External persons may attend on request. (Photo: Claudia Lamas Cornejo | BWG 2013)

LunchTalk in the *Interdisciplinary Laboratory* is a constant in the cluster week. On Tuesdays from 12.30 to 2 pm, members of the cluster or invited speakers give a talk on relevant topics. Cluster members then discuss the lecture in order to identify points of reference, interfaces, or differences from their own work in the cluster. The *LunchTalk* provides members with an opportunity for informal exchange of information and discussion of issues arising from their own research in a protected internal area.

Here they can air theses and findings that are not yet 100% ready to go into print for discussion by scientists in different disciplines. That is why the *LunchTalk* is not, in principle, open to external persons. If you are interested you can send an inquiry to bwg.publicrelations@hu-berlin. Suggestions for contributions by external speakers can also be sent to this address.

Claudia Lamas Cornejo
Head of Public Relations & Fundraising

LunchTalk Reports

Surface and Subface, 04.04.2014

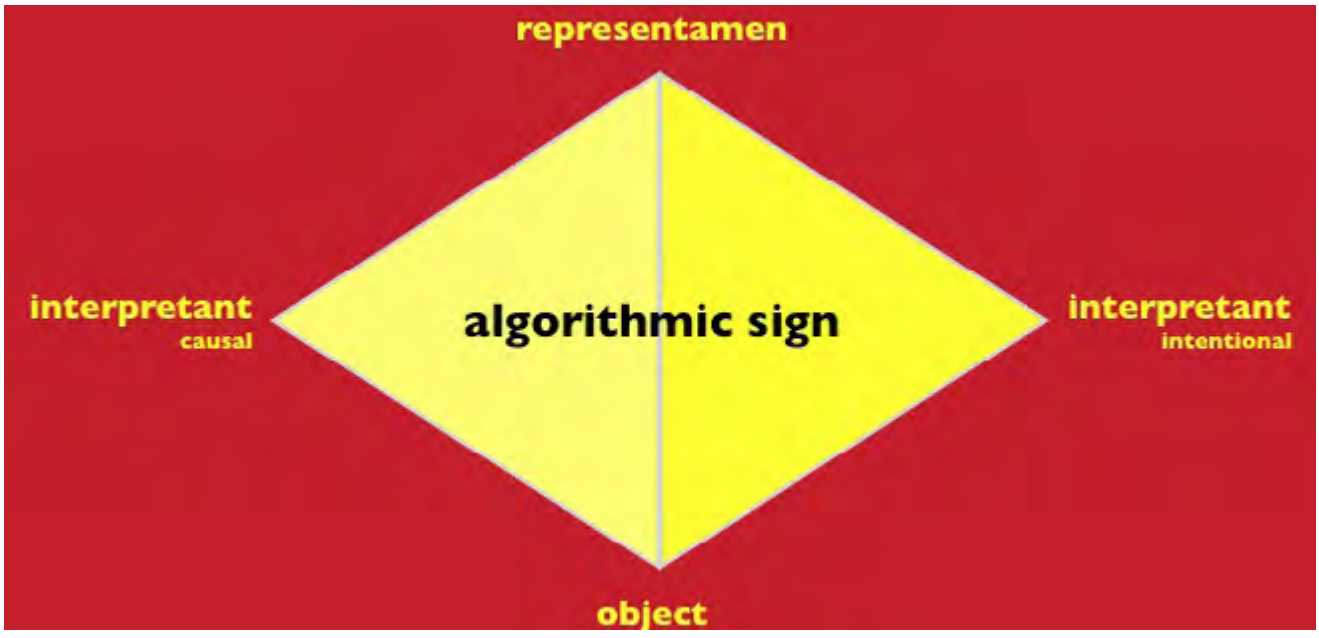


Diagram: Frieder Nake | 2014

For years we have all been looking daily at the screens of the computers we carry around with us. Then there are the even smaller displays of mobiles and smartphones and a growing number of other semiotic devices. What we see are images, but a new kind of image mixed with pointing, depicting and imparting components. Complex agglomerations of the visible. It makes sense to begin by calling each visual phenomenon of this kind an »image«.

My contribution to the *Cluster of Excellence*'s *LunchTalk* was aimed at drawing attention to a property of images of this kind that sets them apart from other images with which we are familiar. Images on computer screens are in general and in principle double. They consist, I shall say, of a surface and a subface. You will soon see what I mean by that because it is obvious, although, or possibly because we talking about something self-evident, their existence as a surface and a subface is a specific feature of digital images.

I must immediately add, and admit, that every drawing on paper and every oil painting on canvas also has a surface and a subface without us getting overexcited about this observation. Occasionally a poor artist paints a second picture on the back of his canvas because he is short of money. This kind of front and back, born of necessity, is a trivial duplication in which the reverse side is in principle the same in kind as the front. It differs only from the visible side that we are shown in that it too can be painted but isn't – or isn't on show. The surface of the traditional image is in the light and its subface is in the dark. It is entirely different, as we shall see, when it comes to surface and subface of a digital image.
Let us approach the subject from a trivial angle. Whatever else we may see on the laptop screen, we will see inter alia a small arrow. We have come to see it as a matter of course (although that has only been so for about 30 years). It is black with a white border, points upward and to the left and is called a cursor (do we still know what that means?). The cursor's function is as much a matter of course for us as its appearance is. Without giving the matter an iota of a thought we run our fingers across a part of the laptop (we may also operate by hand a so-called mouse). We perform a mechanical movement that in itself does not interest us in the least. Our attention is focussed on the cursor.

It has long been second nature to that this mechanical movement of the hand is required to move the cursor. Why do we want to move it? That would surely seem to be an odd question. Yet oddly enough, the cursor's progress does not amaze us even though we do nothing with the cursor. We take it for granted.

Yet on closer consideration what happens is unheard of. The cursor has just occupied part of the screen – the part that its shape and position take up, of course. But if we now move it, even slightly, it changes its position, seemingly caused by our entirely separate movement of the hand or finger, covering a part of the image that we have just seen and revealing another small part that it had just covered.

Nothing of what I have just described so cumbersomely surprises us in the slightest. Everything happens in the way it does as a trival and primitive action in our everyday dealings with the technology. We are aware in every fibre of our being of the problematic nature of what happens, but we are still nowhere near the end of the amazement that we no longer feel.

We know from experience of these technical images that the cursor occasionally even changes shape. We haved moved it across a surface, the desktop, and push or pull it over a border into a window. As we cross the border it happens. The cursor immediately changes shape. It must be highly sensitive. The whole affair is highly erotic in character, I must be allowed to say.

I am inflicting this digression on the reader in order to draw attention by means of a harmless example that we have all experienced thousands of times to the miraculous property of the digital image that decisively distinguishes this class of image from all others. They are not only visible (as we expected); they are also predictable (although we do not as a rule know what that means).

Initially, we are in the world with our senses. Here, on the computer screen, we see. While we are looking, staring and seeing, the computer, or rather its operating system, does what it has to do: to compute. While we think and do nothing on the computer's periphery, it waits eagerly to see whether we might not decide to stroke the cursor a little, to press a key, to breathe into the microphone, to establish a connection. At breakneck speed it checks whether, on its periphery, a signal of some kind pops up that it is designed to »handle« promptly.

In the case of a cursor movement this requires nothing less than basically changing the entire image. We see its surface and the system recalculates its subface. The coupling of the two is so intimate that the calculation immediately recreates the surface of the image. Important changes take place on the subface without us noticing them. The computer (the system) performs the task. Due to this intimate dual existence the digital image is a dynamic image, but it is not a film.

Even then the image on the monitor screen is in a constant state of fast and furious renewal yet to us looks as if nothing whatever is happening and the picture is in a state of wonderful stability. As we have all long learnt, the picture is made up of picture elements or pixels. Every pixel has its place in a finely woven grid and a colour value. But where does it exist? It exists in two states, of course. One is visible, to us, on the screen. The other is computable, for the system, in the display memory. Each visible pixel on the surface corresponds precisely to a raster element in the display memory.

The relationship between surface and subface can be formulated semiotically as an extension of Peirce's concept of the sign. Let it then finally be noted that Peirce's sign is a threefold relationship whose relata he calls the repraesentamen (that which shows), the object (that which is shown) and the interpretant (the one who is meant). In the computer situation they are joined by a quasi-interpreter in the shape of the software, so there are now always two interpreters. A second one that I call the causal one appears on the scene. He is, however, merely the borderline case of the interpretant where there is only one thing to interpret. That is a determination in the sense of a computation. The causal interpretant is a determinant. But that is a further field about which a book is in preparation.

Frieder Nake
Media Design, Hochschule für Künste Bremen

Previous Knowledge and Preparation: Conditions for Image-Guided Intervention, 18.02.2014

Fig. 1: Technical arrangement of US manufacturer Accuray's CyberKnife radiosurgery system used on the Berlin Charité's Virchow campus. On the left the robot arm with the linear accelerator head and on the right the RoboCouch for patients, with a thermoplastic mask screwed into place.

From: http://www.netzwerk-radiochirurgie.de/de/bilder_charite_berlin.html © 2014 Charité Universitätsmedizin Berlin. (last accessed at 10:00 hours on 20/02/2014)

The »Image Guidance« base project is conducting research into images as control media in surgery and looking in particular into how new procedures and empirical values result from short-circuiting between the image medium and the operation. This inevitably touches on key areas of medical practice in which the essential importance of the visual is evident on the one hand while on the other the basics and specifics of imaging techniques are seldom considered in greater detail. This is a desideratum for both clinical practice and medical training. Images from hospital operations are, expressly, applied images and their qualitative value lies in their use and in reliance on their effectivenss. As soon as images become the central point of entry for surgery their form needs to be analysed, and that can only be done in direct exchange with the areas of application to which they add fresh significance.

An exchange of this kind is sought by the »Image Guidance« base project in order, inter alia, to clarify with reference to developments in medical devices how the promises of the latest methods of treatment submit the human body to minute planning in return. Clinical use of radiosurgery, for example, requires a high level of image competence and application-oriented image expertise on the part of the medical and technical staff in order to reciprocally align the patient and the technical system. Diagnosis and treatment planning of tumours and control of radiotherapy are image-guided (1). High-precision radiotherapy systems such as CyberKnife require coordinated connection and reliable and accurate »wiring« of patient, system and the physician's eye because very high doses of photo radiation are applied to the patient's body in a very few sessions (Fig. 1). Thermoplastic head masks immobilise the patient during pre-operative imaging by computer tomography (CT) or by magnetic resonance tomography (MRT) and during radiotherapy. They embody one of the claims made for high-precision CyberKnife radiotherapy: that of coordinated conjunction of the radiation system and the living patient and connection between pre-operative diagnostic imaging and intra-operative image guidance. The CT and MRT visualisations are frequently the only sense-perceptible

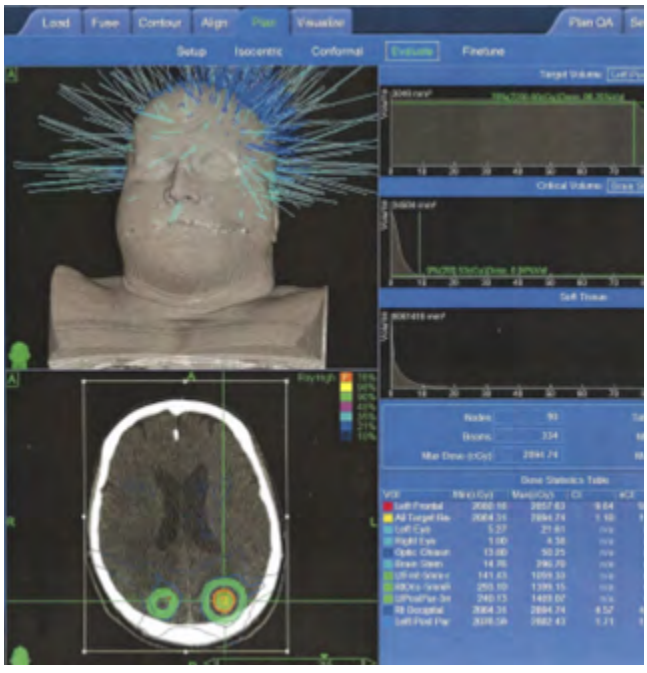


Fig. 2: Screenshot of the MultiPlan preplanning software for the CyberKnife, taken and published by a patient on his blog »The Enemy Returns,« from: http://theenemyreturnp. wordpress.com/2010/04/22/before-and-after-cyberknife/
© 2010 Angelo Kontarinip (last accessed at 11 am on 20/02/2014)

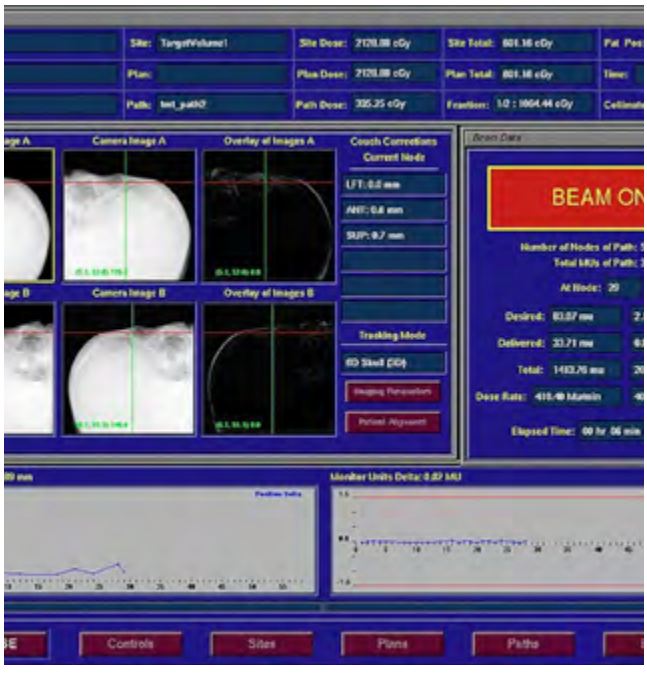


Fig. 3: Screenshot of the CyberKnife control software. On the left are digitally reconstructed X-ray images computed from CT images. In the middle are intra-operative X-ray images on which the digitally reconstructed images are superimposed on the right in order to check the tumour localisation visually. From: http://en.wikipedia.org/wiki/ File:6DSkull.jpg, © 2007 Wikipedia User Steven3045 (last accessed at 11 am on 20/02/2014)

indications that enable radio-oncologists, neurosurgeons and radiotherapy physicists to make statements on the morphology and entity of an inoperable tumour.

Visualisations thus play a decisive part. They are used both for diagnosis and for planning the specific therapeutic intervention. On the basis of the image data radiotherapists can with software support identify the tumour target volume, mark sensitive surrounding structures (such as motor areas or optic nerves) and then calculate the optimal beam path. The plan that then takes shape, coded both visually and digitally, as it were, processed to the radiation unit, and serves as a key reference for »precise« implementation of radiosurgical radiation (Fig. 2). In this situation the CyberKnife robot system and the patient must be so precisely aligned to each other that radiation can be undertaken without deviation and the high-energy photon beam hits only the tumour and not surrounding healthy tissue.

This is not just a problem of data processing and automatic registration but also a genuine image problem. In image-guided radiation systems like CyberKnife, medical and technical personnel rely during surgery on recognising and comparing optically whether the system and the patient are exactly aligned. The use of a radiation mask establishes one of the connections for achieving a certain degree of standardisation between pre-operative imaging and planning and intra-operative radiation. In CyberKnife's control software, pre-operative CT and intra-operative X-ray images are superimposed to enable visual comparison to check whether localisation was undertaken correctly by the system (Fig. 3).

The idea of precisely reproducible coordination of patient, diagnostic imaging and interventional procedure is nothing new in neuro- and radiosurgical practice. The development of so-called stereotaxy can be traced back to the beginning of the twentieth century (2). In principle the concept describes the use of a rigid frame that applies a reproducible system of coordinates to the patient and thereby introduces recognisable and comprehensible landmarks into imaging that can then be correlated to the patient once more in the event of an operation or intervention. Lars Leksell of Sweden transferred this procedure to radiosurgery at the beginning of the 1950s.

His idea was that it would be better to focus radiation that reaches the brain on the tumour by aligning the target volume and radiation source via the systems of coordinates (3). Further development of this basic assumption led to the GammaKnife radiation system, which in modified form has been in use worldwide since the late 1960s. In order to plan intra-cranial radiation with the GammaKnife a rigid frame with a three-dimensional measuring scale is fixed to the patient's skull. The patient was then X-rayed with this or, since the mid-1970s, has been slid into a CT. Further treatment steps can be planned on the basis of the image data acquired and with the aid of measuring and calculation tools. The introduction of CT and digital image processing has accelerated manual calculation of the relationship between frame and tumour volume and simplified the transfer of coordinates from the image to the radiation system.

In CyberKnife the history of the ideas behind stereotaxy and stereotaxic radiation can still be followed, but with the use of real-time tracking and automated imaging the rigid frame screwed to the patient's head has become superfluous. In the transition from »frame-based« to »image-based stereotactic radiosurgery« (4) technical developments of this kind require an updated operative and adaptive visual knowledge that can assess in real time and by means of different image forms how the technical system and the living patient's body are aligned to each other.

The configurations and transformations of this application-related visual knowledge and its historical and present reference framework are one of the »Image Guidance« project's research areas.

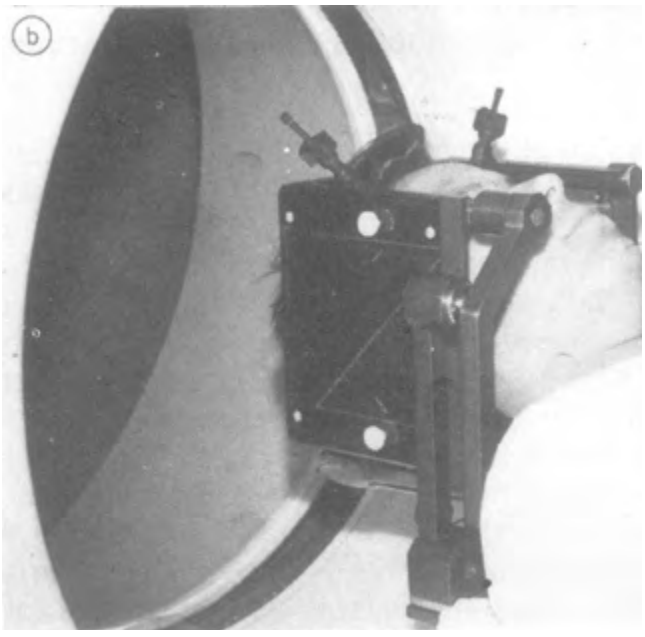


Fig. 4: Patient with a stereotaxic frame before being slid into a computer tomograph to localise the tumour. From: Leksell, Lars (1983): Stereotactic radiosurgery, Journal of Neurology, Neurosurgery, and Psychiatry 46(9): pp. 797–803, 798.

Sources

(1) For greater detail about the structure and elements of image-guided intervention see Jaffray, David A. (2012): Image-guided radiotherapy: from current concept to future perspectives, Nature Reviews Clinical Oncology 9(12), pp. 688–699.

(2) Cf. Schulder, Michael/Patil, Vaibhav (2008): The history of stereotactic surgery, in: Lawrence P. Chin/William F. Regine (eds.): Principles and Practice of Stereotactic Radiosurgery, New York: Springer, pp. 3–7.

(3) Leksell, Lars (1951): The stereotaxic method and radiosurgery of the brain, Acta Chirurgica Scandinavica 102(4), pp. 316–319.

(4) Peters, Terry M. (2006): Image-guidance for surgical procedures, Physics in Medicine and Biology 51(14), pp. R505–R540.

Kathrin Friedrich
Base Project »Image Guidance«

Matthias Bruhn
Base Project »Image Guidance«

GiantCicada – New Drawing Technique to Research the Microcosm, 18.03.2014

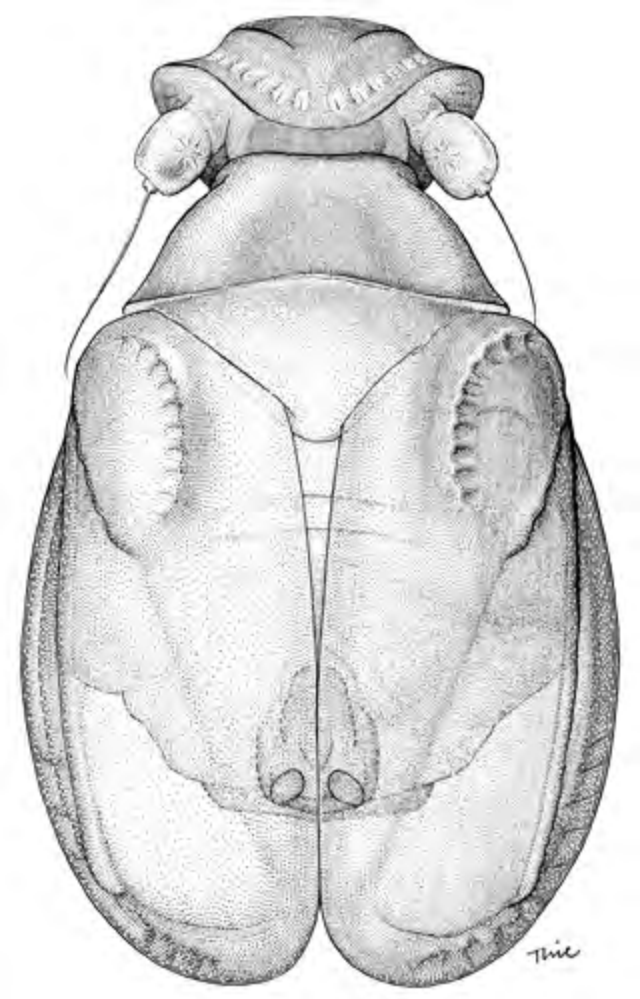


Fig. 1: Meenoplus roddenberyi, a pen drawing of the newly discovered species first published in: Deutsche Entomologische Zeitschrift 2/2012, © Oliver Thie

Hannelore Hoch is Professor of Systematic Zoology at the Museum für Naturkunde and the Humboldt-Universität. She deals with the order of biodiversity. Which organisms exist on the Earth and what are their properties?
Her special area is the Hemiptera group of insects, which includes bugs, cicadas, aphids and psyllids, especially species that live in caves. Over the years she has discovered and described about 70 new species of cave cicadas. To make a previously undescribed species available for science, it is documented according to a certain set of rules of which the main tools are a verbal description and images. Oliver Thie studied visual communication at the Berlin Weissensee School of Art, specialising in scientific draughtsmanship. One of his areas of work is the visualisation of insects, which is why he has been able to form a productive alliance with Prof. Hoch.

The aim of their collaboration is to combine the discoveries of a somewhat amateurishly unprejudiced but precise view with the expertise of a specialist and jointly to develop a portrayal that illustrates the characteristic features of the entire species. In the process individual deviations can be identified and corrected and damage can be repaired. This ability to reconstruct is a major advantage of drawing over other imaging techniques such as photography. Another factor is that the insects that have yet to be discovered are growing ever more minute. *Meenoplus roddenberyi* is indeed the smallest cicada yet discovered. That takes photography even further to its limits.

Microscopes are required for research into animals of this kind to reveal their morphology step by step. As you immerse yourself into a wealth of new structures your field of vision is narrowed and you increasingly lose sight of the overall picture. Individual parts take on a life of their own and lose track with the whole, the larger picture is no longer apparent. Increasingly sensitive equipment intensifies the problem. The technical view today is determined everywhere by a sectional approach and an integrated and thus sensory impression is almost impossible to gain.

A drawing, in contrast, is as able as it ever was to connect and bridge impressions. Without needing to bring up heavy technical artillery a drawing can overcome the sectional view and restore an overview. The decisive aspect is that the choice of a magnification factor for the final portrayal imposes a limitation and sets a framework as to how much detailed knowledge can be incorporated that is of use for science. With their ongoing project Ms. Hoch and Mr. Thie aim to extend this framework immensely and thereby to enter uncharted territory for scientific illustration.

Fig. 2: Oliarus polyphemus, original size 3–4 mm

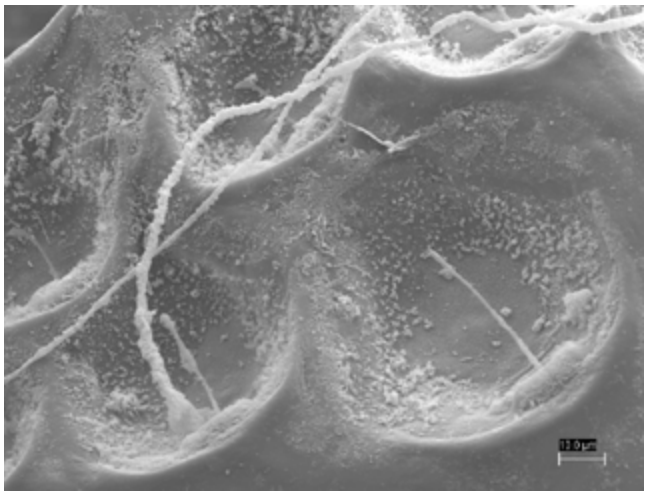


Fig. 3: Raster electron microscope image of sensory hair cavity on the head

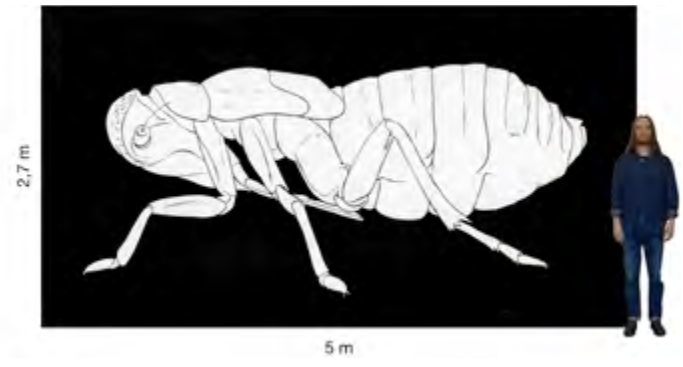


Fig. 4: Untitled

The cave cicada *Oliarus polyphemus* (Fig. 2) is a special creature. Tiny, blind and colourless, it survives in one of the most extreme environments in the world – lava caves on the islands of Hawaii. How does it find its way around in total darkness? How does it find the sparse food or a mate? And how does it escape from the many predators, all of which are much larger and more mobile than it is? To understand the cicada you must study its body precisely, look for the anatomical features that enable it to live in this unusual way. To do so, devices are used that convey a picture of its microscopic forms that is legible. But there are still limits to what can be accomplished. Photographically these tiny creatures can be shown true to life, retaining their posture, their colour and their transparency. But the possibilities of magnification are limited, as they are with all light-based instruments.

The raster electron microscope is much more detailed (Fig. 3). It enables us to discover so-called sensory hair cavities that cover the entire body and are probably a hitherto unknown sensory organ. But the images in the requisite magnificent only show minute sections. An overall view would have to be reconstructed from hundreds of images, and matching them precisely is technically impossible. Quite apart from that, the electron microscope provides only a very artificial picture. The animal looks colourless and opaque and is usually unnaturally bent in death.

Expressed in simple terms, photography may delivery true-to-life images but it shows too little detail. The electron microscope can magnify enormously but remains unnatural and extremely sectional. A new kind of visualisation method needs to be developed and the project undertaken by Hoch and Thie might be a solution. The draughtsman's skills are to be used to connect previously isolated image data. Each individual observation, no matter how minute, can then be seen in relation to the entire body, so the morphology of the cicada can be covered to a cross-scale degree, making new scientific interpretations possible.
Approaching an image of this size will enable the observer to recreate the path that the eye takes through the microscope while the full picture remains in full and unrestricted view.

Each individual observation, no matter how minute, can then be seen in relation to the entire body, so the morphology of the cicada can be covered to a cross-scale degree, making new scientific interpretations possible.
Approaching an image of this size will enable the observer to recreate the path that the eye takes through the microscope while the full picture remains in full and unrestricted view.

As you come closer to the image it will continuously reveal new details without a border taking shape at too early a stage while also giving rise to a field of graphical research. To achieve a satisfactory resolution for all viewing distances the drawing must be made in the size envisaged. So the draughtsman must develop graphical means that give shape to the microstructures and at the same time model the entire body.

This explains the choice of a drawing technique that has its origins in the etching (see Meenoplus roddenberyi). Using the wide range of options provided by the use of lines and dots, surface properties can be shown almost in code right down to the minutest configurations, which would not be possible with other kinds of shading.

Hannelore Hoch, MfN Berlin & Oliver Thie, Kunsthochschule Weissensee

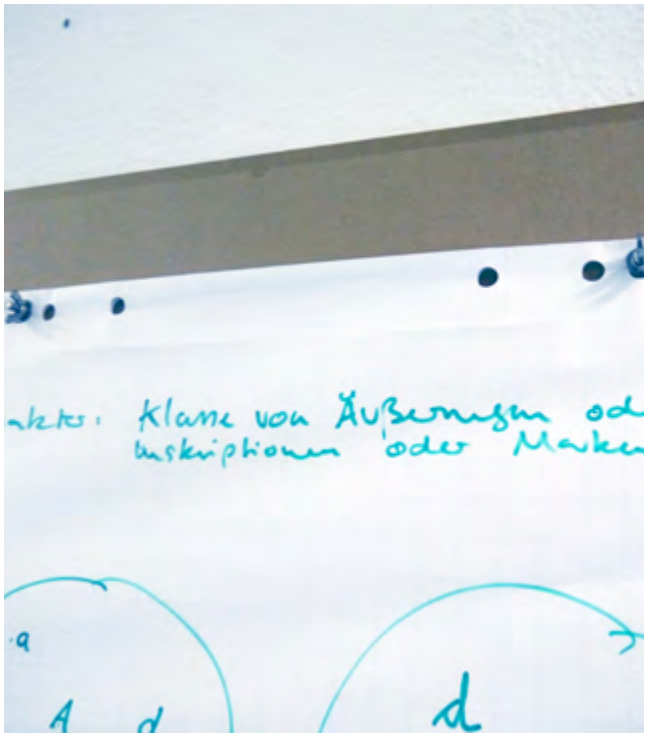
Cluster Gestaltung, 25.03.2014

The *Interdisciplinary Laboratory* is intended to create a working environment that provides the best possible conditions for interdisciplinary research and collaboration. Concepts for this have not been specified and must be geared to the needs of the users and the base projects. The precondition for their Gestaltung or design is that the users must be prepared to accept new concepts – and that concepts are adjusted comprehensively if they fail to function.

On the basis of this premise the Cluster Gestaltung working group has developed a user manual that since 11 February 2014 has change the use of rooms in Sophienstrasse on a trial basis. In recent weeks the working group has immersed itself mainly into the repercussions of the reorganisation and planned, on the basis of feedback from users, further adjustments to the working environment in the *Interdisciplinary Laboratory*.

To provide information about the latest developments and elicit more feedback as the basis for further offerings the working group presented the User Manual and the new and planned adjustments together with a request to users to continue to inform it of their experiences and requirements. A major misunderstanding of room usage has persisted, as a result of which several mentions were made of the fact that users do not have to clear their desk every evening and set it up again the next morning. All workplaces are available for use by all employees. Every workplace can be used for as long as it is suitable for an activity or an individual. It is helpful to note on the boards attached to the doors or rooms when a workplace is required. Nobody should feel barred in a room where other people are already sitting from using an empty workplace. If one is not needed for some time, roller containers and display surfaces in the corridor are available for use as a parking lot.

The roller container can be expanded to provide further functions. (Photo: AG Clustergestaltung | BWG 2014)



The mobile screen for presentations and the display surface with a new bracket for flipchart sheets. Photo: AG Clustergestaltung | BWG 2014

Feedback until the *LunchTalk* & Implementation of Proposals for Improvements

Positive feedback received so far has mainly related to the *Quiet Rooms*, which are used as an alternative to the library. Respondents also reported that moving between the different rooms for different phases of work (work that requires concentration, discussions) structure the working day well. There have also been many suggestions for improvements. Overall, the rooms are poorly sound-proofed, and especially in the quiet wing people find it very disturbing if conversations are held in other rooms or in the corridor.

In response to this the wing was marked »Quiet« from the metal door to the staircase and an earplug dispenser was installed behind the door. Another idea under consideration is to carpet the corridor to muffle the sound of footsteps. It was also noted that the window workplaces in particular fail to fulfil all of the ergonomic requirements of a computer workplace. For one, more attention is to be paid ergonomics in fitting out the fourth floor; for another, everyone can and should set up their workplace in the way that suits them best. Window workplaces can, for example, be used for reading. For presentations a giant screen on castors is available.

The roller containers are not optimal for all employees either, which is why alternatives are available: cupboards in different sizes and shelves on wheels. New »transport facilities« have also already taken shape. For the display surfaces Julia Blumenthal has designed a trolley that can be used to manoeuvre the display panels through door apertures. She has also expanded the range of roller containers. Rebekka Lauer's roller container has been equipped with better castors and more shelving and display space for test purposes. The relative bareness of the rooms was also seen as worthy of improvement. For one, metal rails are being fixed to walls in both rooms and the corridor to make it easier to attach display surfaces to them. Another suggestion was that base projects and self-defined working groups should be enabled to get together for longer periods. With this in mind zones for »fixed workplaces« are being considered ahead of the move to the fourth floor. Nearly every response received so far has also found fault with the lack of opportunity to share news and views due to the fact that relatively few employees are regularly to be found in Sophienstrasse except on Tuesdays. This is a point that is also constantly discussed by the Cluster Gestaltung working group.

Feedback and Responses in Discussions

The contributions to debate resulted in a wide range of suggestions. Rearranging furniture in the central laboratory requires resources – and that must be taken into account – whenever events such as the *LunchTalk* or the *Interdisciplinary Controversy* are due to be held.

The office, which plans these rearrangements, is always grateful for helping hands. The freedom to arrange a room for one's own and spontaneous purposes was felt to warrant the effort and expense of rearrangement. The totally flexible space model was in any case outdated and a varied arrangement of desks in the *Central Laboratory* was felt to be adequate. Room conflicts and everyday observations should be documented and, in particular, the reasons for absences clarified. Some respondents felt the fact that many of the shortcomings that users mentioned related to the acoustics (it was said to be not easy to work next door to the workshop, in the central laboratory or even in the quiet wing) did not make sense because the problem was easy to solve by wearing headphones.

Yet more intensive use should be made of the concept of »Thinking and Meeting in Great Openness« vs. »Retreating into the Thinking Cell«. Dynamic presentation of the base projects in, say, the corridors was considered extremely important to trigger discussions about progress achieved.

The time it took to look for people and free rooms was said to be a challenge, a response to which was that more intensive use should be made of the virtual level. There was confirmation that many details now function much better than they did initially and that the Cluster Gestaltung offers everyone great opportunities to design their working environment. It was indicated that the *Interdisciplinary Laboratory* is always open for new suggestions.

AG Cluster Gestaltung
(More fellow campaigners are always cordially welcomed):

Faten Ahmed | Julia Blumenthal | Ronald Göbel | Karl W. Große | Anouk Hoffmeister | Andrea Knaut |
Henrike Rabe | Friedrich Schmidgall | Sebastian Schwesinger | Amaya Steinhilber | Deborah Zehnder

Metal rails enable display surfaces to be hung up (Photo: AG Clustergestaltung | BWG 2014)

The *Interdisciplinary Controversy* in the *Interdisciplinary Laboratory*

The *Interdisciplinary Controversy* takes place at regular intervals up to twice a month (Photo: Claudia Lamas Cornejo | BWG 2013)

The *Interdisciplinary Controversy* is a discussion format of the *Interdisciplinary Laboratory* in which individual concepts or models are discussed, always from the perspectives of two different disciplines. It is less a matter of a precise definition of a concept than one of working out overlaps and intersections between individual disciplines in respect of a concept or a method.
Participation in an *Interdisciplinary Controversy* is by request only. Please e-mail bwg.publicrelations@hu-berlin.de.

»*Interdisciplinary Controversy*« on the Subject of »Space«, 27.02.2014

At last Thursday's *Interdisciplinary Controversy* in the central laboratory room on the subject of »space«, research into space in the historical past by Classical Archaeology (Susanne Muth) and on currently used auditive space by Sound Studies (Holger Schulze) entered into an exciting dialogue.

The discussion on how to succeed, from the perspective of different disciplinary approaches, to convincingly reconstruct how specific spaces were experienced culturally and in their use in space and time was moderated by the architect Sandra Schramke.

Photos: Claudia Lamas Cornejo | BWG 2013

»Forms of Spatial Knowledge: Dirty Details of the Forum Romanum« – Archaeology & Sound Studies in Dialogue

Present-day excavations at the Forum Romanum in Rome (Photo: Susanne Muth | BWG)

Digital reconstruction of the Forum in about 14 AD (Digital reconstruction: © digitales forum romanum, Winckelmann-Institut HU-Berlin)

Disciplines such as Classical Archaeology and Sound Studies would not appear to have many points of contact in day-to-day research. Classical Archaeology conducts research into the material remains of the historic civilisations of Ancient Greece and Rome and attempts to make them speak once more as historical sources. Sound Studies concentrates on auditive aspects of traditional technological, cultzural and scientific history and ethnographic studies about sound in the public space in present-day everyday culture. That is why an encounter between the two disciplines may come up with surprises. Taking as an example our controversy about the Forum Romanum in antiquity we would like to demonstrate the potential for changes in research issues and additions to research methods that can be found in this innovative dialogue – and how both disciplines might benefit from a joint research project.

The Forum Romanum as a Subject for Research

The Forum Romanum, with which every visitor to Rome will be familiar as an atmospheric landscape of ruins in the heart of the modern city, was once the public centre of the ancient metropolis. This was where all kinds of public and political life pulsated, where history was made and experienced, where the powerful sought to enslist the support of the people and where the citizens sealed the fate of political careers and, at times, deciding on life or death. Since excavations began in the late nineteenth century the many generations of classical archaeologists have undertaken intensive research into the Forum Romanum. There can be few places in classical antiquity to which they have paid more attention. Above all since the 1970s, when archaeology began to see itself as a (cultural) history discipline, they have increasingly seen the Forum as an authoritative source for the reconstruction of life in Ancient Rome and to interpret the historical space as a mirror of Ancient Roman society. In the process, discussion about the Forum has developed into a perfect example of methods and issues arising from archaeological research into sites from the Ancient World. To this day issues relating to the symbolic capital of the built space, seen primarily as a space to be experienced visually, have predominated. Buildings and monuments that used to characterise it have been interpreted as instruments of political representation and creation of social identity – and changes in the Forum's architectural design over time have accordingly been seen as a reaction to changes in the political system, in the ideology of the rulers or of political power. Only recently have archaeologists begun to adopt a more pragmatic approach. It directs attention more toward the specific use of the space and seeks accordingly to discuss concepts and changes in the architectural design of the Forum against the background of functional requirements of the space.

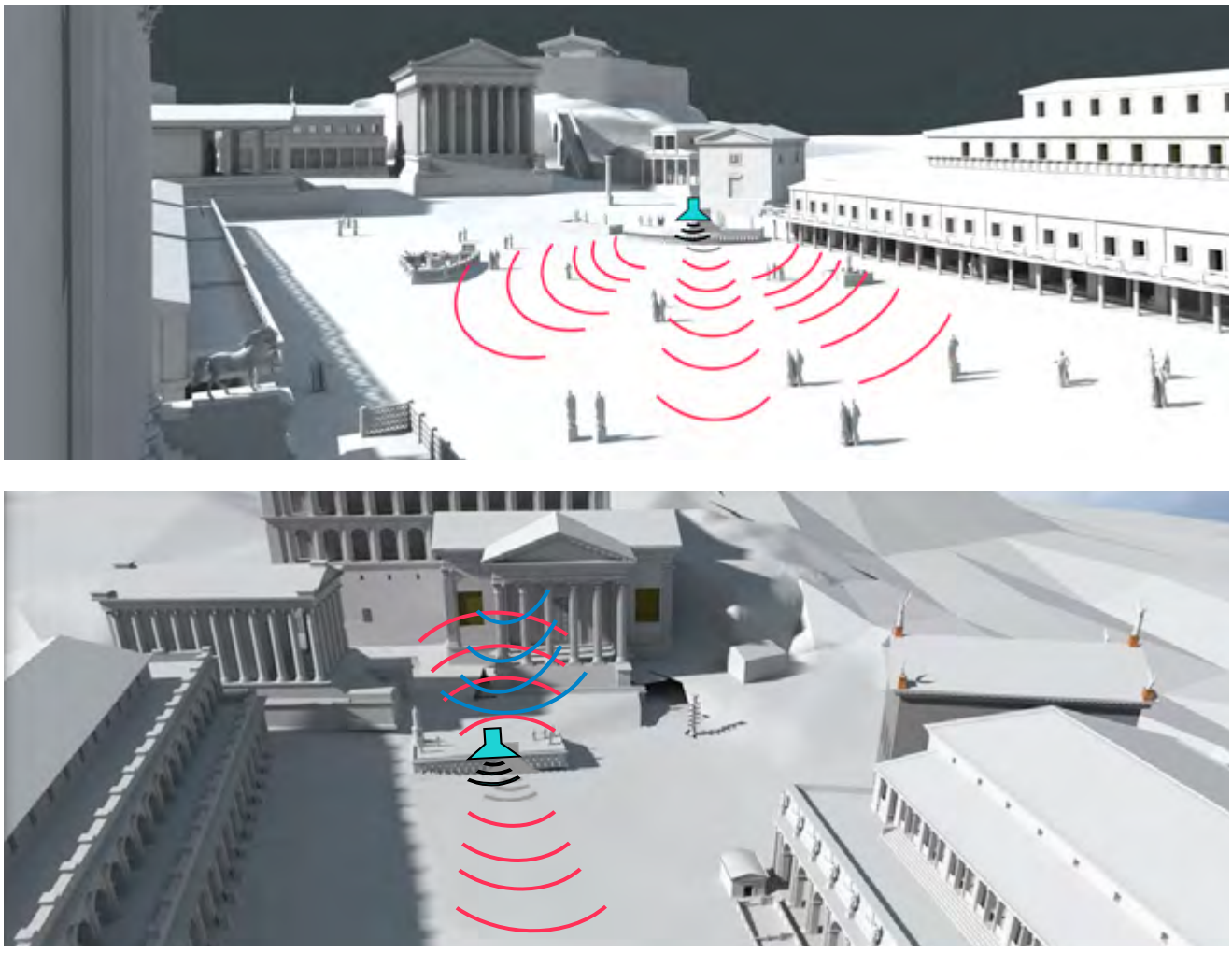
Places where speeches were made and positions of the rostrum and the public: on the left before the mid-second century BC, in the centre after the mid-second century BC and on the right after Caesar in 44 BC. (Images: Susanne Muth | BWG 2013)

Changes to the Forum as a Place for Political Speeches: Where Does the Speaker Stand?

The use of the Forum as a space for political communication between the rulers and the citizens may serve as an illustration of this change in perspective. It also shows where Classical Archaeology and Sound Studies suddenly enter into a profitable dialogue. The politicians, and later the emperors, addressed the assembled citizens from a rostrum on the perimeter of a meeting place. Fairly smooth functioning of this communication was of vital importance: for the state, for the citizens and for the politicians who were competing for power or the ruling emperors. Legislative proposals were presented here for the people to vote on, politicians appealed for electoral support, court speeches were held, declarations of war were proclaimed, proscription lists were published, etc. The successes of a Cicero or a Caesar were based on their regular appearances on the rostrum. Reasonably effective acoustic and visual communication was thus the A and O of making use of this political space. Interestingly, however, the locations of both the meeting place and the rostrum changed over time. For centuries they were both in the northwestern corner of the Forum near the Senate building, the Curia. Initially, speakers spoke with their backs to the open space of the Forum toward the Curia while the citizens gathered between the rostrum and the Senate building. From the mid-second century BC onward the speakers began to turn round on the rostrum and address the open space of the Forum where more people could gather. In the mid-first centry BC the famous Caius Iulius Caesar had the rostrum demolished and moved to the narrow western side of the Forum's open space.

Symbolism versus Pragmatism: Acoustics as the Problem

This move by Caesar is generally seen mainly as an ideologically motivated measure. Just as Caesar ushered in the political transition of Rome from a republic to a monarchy and had little confidence in the old republican system and its political institutions (the Senate and public meetings), he is said to have ignored the long-established place of political decision making and wanted to move public meetings away from direct spatial control by the until then predominant Senate by relocating the rostrum. This interpretation sees this move as the mirror of a political programme of rule. But if the space is looked at from a less symbolic and a more pragmatic perspective an entirely different suspicion might account for the change. The different interventions in the place of assembly and the position of the rostrum may have been the result of experiments with the acoustic (and visual) framework conditions of communication in the space available. Prior to the mid-second century BC the conditions were in order. The speaker spoke to a space that sloped slightly uphill and was bordered by the façade of the Senate building. But in about the mid-second century BC this assembly area became too limited as the population of the prosperous metropolis began to rise by leaps and bounds. That was why the speakers turned round on the rostrum – because there was then space for a much larger audience. But the acoustic conditions deteriorated perceptibly. How well speakers were understood at all by the citizens and how much of what they said had to relayed to the rear (with an increasing loss of content) was a serious issue in an assembly areas where in the mid-first century BC politicians like Cicero or Caesar were active and it was increasingly important as the political situation in Rome grew more and more tense for speeches to be understood



Places where speeches were made and where the public were after Caesar (Digitale reconstruction: © digitales forum romanum, Winckelmann-Institut HU Berlin).

precisely. Not for nothing do reports survive from this period of growing tumults and staged interruptions of these speeches in the Forum. This is a specific point to remember if one is to understand the change that Caesar went on to make there. By removing the rostrum from a location that had become unfavourable, at an angle to a wide-open space, he relocated it on the slightly higher western narrow side of the Forum so that speeches could in future be made in an acoustically (and visually) much improved spatial constellation. From then on, politicians (and after Caesar the Roman emperors) could address the assembled citizens from an elevated platform with their backs to an architecture of soaring pillars that was comparable with stage settings in theatres at the time. So it is plausible to attribute the relocation of the rostrum by Caesar to a much more banal and very pragmatic intention rather than to seek ideological and symbolic interpretations that, moreover, carry scant historical conviction. From then on, speeches by the powerful in the Forum were easier to hear and enabled the speakers to gain more control over their audiences again. On the basis of its methods and specialist competences Classical Archaeology can reconstruct by analysing architectural changes what happened to the Forum Romanum and establish that an improvement in its acoustics did occur. It cannot say, however, what this improvement in quality was? What had to be borne in mind as a general rule in redesigning political spaces of this kind? How could the historical situation of a speech by, say, Cicero in the Forum be reconstructed even partially? This is the point at which Sound Studies come into play and introduce other research questions.

How Does this Space Sound? The Sound Studies Approach

Sound Studies is a young and as yet largely non-disciplinary field of research that chooses and combines its methods and approaches, even its subject matter, back

Two publications from the Sound Studies (Illustrations: Holger Schulze | BWG 2013)

and forth and often in a parasitic manner. Its methods are not taken, as you might imagine, only from physical, spatial and structural acoustics and not only from electroacoustics and the aesthetics of sound art and sound design. They are borrowed primarily from cultural and media research, for one from cultural anthropology and its ethnographic approaches, for another from historical and social science methods and the cultural history of technology approach or, to be more precise, Science & Technology Studies (STS). Sound Studies uses all of these approaches to answer the question: What did or does this historical or contemporary space sound like in physical and sensory terms? Which technical and cultural sound concepts were or are of importance for it to do so? What effect do the sound and a sound concept of this kind have on how the people who live here and use, enliven and live in its rooms and apparatus act and experience it? In these questions, as already indicated, the history of technology and sensory anthropology meet. They take Sound Studies to a materialistic approach to research. Sounds and noises are investigated primarily in terms of their tangible (or barely tangible) details and their material repercussions. By concentrating on many, often studiously ignored physical and physiological details and a sound and auditory situation a far more complex and dynamic, more situation-specific reconstruction is possible. The everyday nature of a situation can be outlined in its dirt, its frequently glossed over details of use, its daily use, its customary and usual character, its climatic and interpersonal, its habitual and erratic, its worn-out and undesirable, even its tinkered with and negligently lost aspects. Beyond the necessarily idealistic, currently used models involving straight lines, dust-free and polished surfaces, a constantly clear blue sky, the static sunshine and handful of motionless humanoids who are around, other, dirtier models are possible. Hypotheses about what may actually be (or have been) heard at these locations acquire a basis. The daily pragmatism of human life finds its way into research. With the aid of this so-called sonic materialism possible effects, actions and modes of experience can now be described, and with a much higher probability and proximity to life.

Dirty Details of Forum Romanum: New Research Issues

From the vantage point of non-archaeology Sound Studies raises questions and queries about highly specific and deliberately profane, often extremely microscopic aspects of the space in question and its use. These questions clearly outline historically and culturally shaped forms of knowledge that relate to the specific use of a given space. For any further auditory and fundamentally sensory research into the factual use of the Forum Romanum the following questions thus arise: What was the weather like (wind directions, scorching heat, sultriness) and how did it influence the audible behaviour of audiences (sun covers, drinks, higher levels of irritability or weariness)? Which people were present in which habit or disposition

and with which relatives and dependents (servants, wives, slaves, children, etc.), and how well exercised were they in the practices of listening, heckling, holding conversations on the side and voting? How noisy or disciplined, how noisily semi-interested or discreet is their behaviour likely to have been? What were the properties of the floor (paving stones, polished, dirty, stubby, shoals or shallows) or those of the textiles they wore and the surrounding furniture or equipment – and how was that likely to irritate or stabilise the collective hearing attitude, to multiply or reduce the noise of people moving? What activities took place in the buildings and streets of neighbouring districts when a speech was held, given that this extended acoustic horizon (Blesser & Salter 2006) directly affected the hearing situation in the Forum Romanum? These examples of question convey an idea of the detailed nature of the research. Sound Studies deals with the audible side – the aural architecture – and not with its symbolic representation. It deals with the experience of users, audiences, the many people who spend hours a day at a location. Their highly varied forms of spatial knowledge in a specific sound environment are what interests us because we inevitably lack them in our predominantly static models. The body-related details of hearing, the many granular and possibly unpleasant, even embarrassing details of day-to-day human life are the subject of a sensory and acoustic anthropological study of such a place. We are talking about a hearing perspective (Auinger & Odland 2007) of everyday life, of the uses to which a place is put for months and years. How do its sounds, its noises, its murmur of incessant hearing and action register on people's habits, physical techniques and customary actions? Dirty pragmatism guides this research and traditional symbolism steps back. It generates an ambient noise that affects the daily activities of local people and has a sometimes more and sometimes less significant effect.

Literature and Material

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Photos of the digital model of the Forum: »digitales forum romanum« Projekt des Winckelmann-Institut der HU; visualisation/3D model: Armin Müller; website: http://www.digitales-forum-romanum.de/

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H. Schulze, The Audible Room. Towards a Historical Anthropology of Sound in Architecture, in: A. Wilson (ed.), Listen! Sound worlds from the body to the city, Cambridge Scholars Publishing Newcastle/UK 2014 (in print)

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Susanne Muth
Principal Investigator

Holger Schulze
Associated Investigator

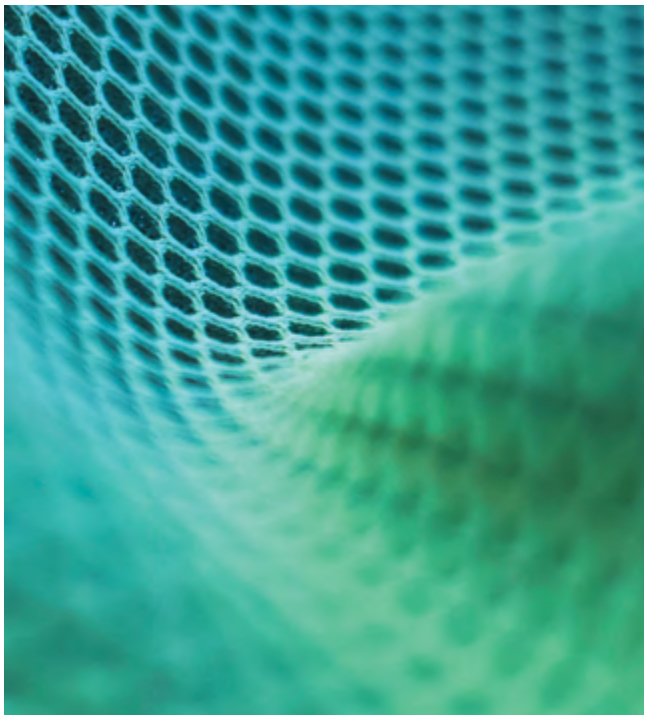
In Conversation with...

The interview with Thorsten Beck on the »Speaking Images – Speaking of Images« exhibition met with great enthusiasm, triggering the start of the »In Conversation with...« interview series in the Cluster magazine CZ#. (Photo: Frauke Stuhl | BWG 2014)

The interview series *»In Conversation with...«* presents members of the *Interdisciplinary Laboratory* and their present and future projects, research work or events. The format aims to convey issues strikingly and in brief and to link content with the people involved. *»In Conversation with...«* provides an overview of disciplinary, methodical and content diversity in the Cluster and sees itself as a starting point for in-depth discussion and further exchanges between members of the Cluster and external players.

Claudia Lamas Cornejo
Head of Public Rrelations & Fundraising

In Conversation with... Karin Krauthausen & Friederike Saxe: The »Structure – Tissue – Surface« Lecture Series



Close-up of a spacer fabric by the graphic designer Kerstin Kühl, 2014

Claudia Lamas Cornejo: What is the Interdisciplinary Forum lecture series about?

Karin Krauthausen: It is about structure, tissue and surface. The lecture series is a product of the Interdisciplinary Laboratory in that structures play an important role in many Interdisciplinary Laboratory base projects and are also an element that connects design, cultural studies and science.
The central role played by structures in the twentieth century can easily be followed in the debates in different fields of knowledge. In bptj science and the humanities and in certain areas of technology structural thinking is very evident even though the concept of structure may be understood differently and thus appear to be blurred overall.

Claudia Lamas Cornejo: What shape does this blur take?

Karin Krauthausen: Basically the concept is defined differently in every discipline, ranging from abstraction to materiality. That is where the work of the Interdisciplinary Laboratory kicks in, including the newly launched base project on »Structural Science and 3D Code« that is, inter alia, looking into ideas for a new structural science. The aim here is to merge from both a historical and a time-diagnostic perspective the abstract and the material components such as those that are used in physics, which has a concept of structure that has strong ties with material.

Claudia Lamas Cornejo: What issues are dealt with specifically in the lecture series?

Friederike Saxe: The lecture series will act on two levels. The first is that of the structure concept, which is to be explained from the viewpoint of each discipline that is presented. »How is the concept of tissue used in the different disciplines?« could, for example, be a question for each speaker.
Speakers will also provide specific examples from their research practice to illustrate how the concept is handled in their respective disciplines. The second level is aimed directly at the audience who come from a wide range of disciplines and may have no idea of the approaches and methods used by the other discipline. In order to provide an overview of different disciplines each speaker will outline how they develop issues in their respective discipline.
Karin Krauthausen: The lecture series will present a panorama of disciplines but will in no way be a full and complete selection.

Claudia Lamas Cornejo: Which disciplines are taking part in the lecture series?

Friederike Saxe: It starts with Horst Bredekamp, an art historian and expert in visual studies, followed by Peter Fratzl, a physicist by training who now devotes himself to materials science and, more specifically, to biomaterials science. In the designer Carola Zwick we have enlisted the services of someone who as a professor at the Weissensee

School of Art represents both theory and teaching in addition to the practical implementation and development dimension of design with her Büro 7.5. Oliver Hahn of the Federal Institute for Materials Research and Testing is a materials researcher, Susanne Muth represents classical archaeology, Gerhard Scholtz as a zoologists stands for biology and Wolfgang Coy belongs to the first generation of computer scientists (computer science only became an academic discipline in the 1970s) and was originally a mathematics and engineering graduate. The lecture series comes to a close with the cultural studies specialist Wolfgang Schäffner.

Claudia Lamas Cornejo: What do you expect or hope to learn from the lecture series?

Friederike Saxe: It will provide an overview of different disciplines and their methods and approaches. Ideally each approach will be discussed and questioned. Students are to be prompted by external observation to take a critical look at their own discipline and also, or so we hope, be motivated to develop research questions of their own. The last lecture, Wolfgang Schäffner's, will try to demonstrate how, in view of this panorama of disciplines, to approach research questions in your own discipline or within the framework of an interdisciplinary approach.

Claudia Lamas Cornejo: What is the target audience of the lecture series?

Friederike Saxe: Primarily students in all disciplines. We are grateful to a number of disciplines, including physics and cultural studies, for include it in their course catalogue.
Karin Krauthausen: The discussion round at the end of each lecture is aimed explicitly at the students who attend. It is an opportunity for them to ask the lecturers for further information or to contribute their own experiences. We are also looking forward to members of the Interdisciplinary Laboratory taking part in and enriching the discussions.

Claudia Lamas Cornejo: What must students do to get credits?

Friederike Saxe: Students receive one credit for attending the lecture series and two if they also submit a short abstract of three to five pages on a research topic of their own. Any area of research is welcome.

Karin Krauthausen: This draft of a research topic could, for example, be their next assignment or the subject of their bachelor's thesis about which they will describe the research issue.
Friederike Saxe: It is important for us that the lecture leaves plenty of time for questions and exchanges. That is why each lecture is limited to one hour and we will try to trigger a dialogue that goes beyond the scope of a typical university lecture.

Claudia Lamas Cornejo: Thank you very much for the conversation!

Claudia Lamas Cornejo
Head of Public Rrelations & Fundraising

The literary and cultural studies specialist Karin Krauthausen and the biologist Friederike Saxe are coordinating as scientific supervisors the Interdisciplinary Laboratory's lecture series on »Structure – Tissue – Surface«.
The series, consisting of eight sessions, start on 16 April 2014 and will take place at fortnightly intervals on Wednesdays from 6–8 pm in the lecture theatre 2.07 in Dorotheenstrasse 26.

In Conversation with... Christiane Waldau: The ABC of the Cluster Library

Since September 2013 Image Knowledge Gestaltung's Interdisciplinary Laboratory has had a library of its own at Sophienstrasse 22a. Christiane Waldau, who is studying for a master's in library and information science at the Humboldt-Universität zu Berlin, has been in charge of the Cluster Library from the outset, including building up stocks, which have increased rapidly in recent months.

Christiane Waldau has been in charge of the Interdisciplinary Laboratory's library from the outset in Rooms 3.10 a and b on the third floor of Sophienstrasse 22a. (Photo: Sophia Gräfe | BWG 2014)

Claudia Lamas Cornejo: The Interdisciplinary Laboratory library is growing by the week. What is its acquisition strategy?

Christiane Waldau: The Cluster Library's aim is to collect books, essays, magazines and DVDs that are of interest to the Cluster as a whole. That is why the current acquisition strategy is strongly geared to the needs of the *Interdisciplinary Laboratory* members, in other words, anyone in the Cluster can suggest an acquisition by e-mailing bwg_bibliothek@hu-berlin.de with a brief explanation why the title is of relevance for research in the Interdisciplinary Laboratory, for a key topic, for a current debate, for learning with... or as a topic for the *CZ#*. Suggestions are then collected on a central list that is sent to the Cluster's two directors who check it and in most cases give the go-ahead. Separately, the base projects acquire their own literature. They can set up a reference section in the library, a section where all of the base project's books are in one place and centrally available for all project participants. Reference section books have a blue stripe that sets them apart at first glance from the library's regular stocks, which can be taken out on loan by all Clubs members.

Claudia Lamas Cornejo: What must I bear in mind when suggesting an acquisition?

Christiane Waldau: You don't need to write pages in justification or to name colleagues who also want the book, but it should be clear that the title is of interest for more than one member of the Cluster.

Claudia Lamas Cornejo: How is the library currently arranged? How do I set about looking for a title?

Christiane Waldau: We are currently arranging titles by subjects based on a classification that is well networked on the Internet and is updated by the GBV, our joint library association. You can search well on Zotero, where all entries are in place and you can search by author, title or keywords. Zotero shows you the book number, enabling you to go to the right shelf and find the title you want.

Claudia Lamas Cornejo: Are titles arranged by Cluster subjects?

Christiane Waldau: No, we use a standard scientific classification. There are, for example, architectural, design, literary, biology topics – in short, the arrangement reflects general areas of scientific knowledge. A special fit for Interdisciplinary Laboratory has been discussed from the outset, but in practice we have not been able to implement one.

Claudia Lamas Cornejo: Once I have found a title, how does the lending procedure work?

Christiane Waldau: Lending is handled at the library, where there is a filing cabinet in which every book has an index card. I write my name and the date on the index card for the title I want to borrow. The card is then placed in a separate section of the filing cabinet so that it is clear who has taken out which title. When returning it you simply leave the book in the marked return area.

Books marked in blue are part of the reference library for the *Interdisciplinary Laboratory*'s base projects.
(Photo: Sophia Gräfe | BWG 2014)

Claudia Lamas Cornejo: Is there any limit to the length of time you can take out a book?

Christiane Waldau: Formally it is seven days, renewed automatically if the title is not returned. That continues until a reservation for the book is received. I then send the borrower an e-mail explaining that someone else would like to borrow the book and they must return it.

Claudia Lamas Cornejo: New acquisitions by the Cluster Library are also presented at regular intervals in the Cluster newspaper CZ#. How are the book reviews written?

Christiane Waldau: At present that is done very classically by researching a title on the publisher's or author's website, on the Internet in general, including reviews, and by reading the title itself. In future, however, we would like to extend a cordial invitation to all Interdisciplinary Laboratory members who suggest a title for acquisition by the library to write their own reviews of the new acquisition. There is always an idea behind a suggestion and every book that is acquired fits the Cluster's canon. Current discussions can be shaped more actively in this way.

Claudia Lamas Cornejo: In addition to the Library's physical presence there is a separate page in the internal section of the Image Knowledge Gestaltung website. What can you find there?

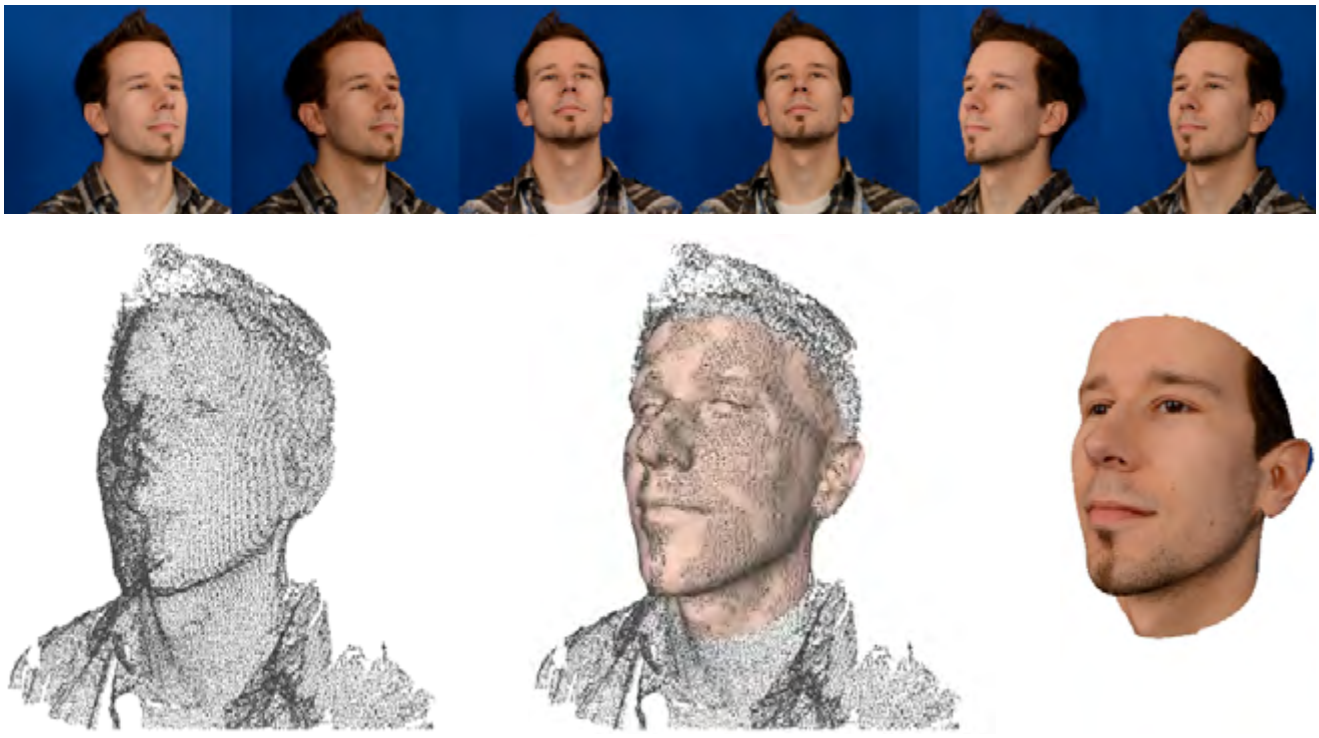
Christiane Waldau: The Library's internal website page lists all Zotero entries. What is new about that is that the only entries shown are those that are actually available in the Image Knowledge Gestaltung Library. In other words, we are compiling our own catalogue. In future the website will include further research filters and documents to download such as feedback forms and forms for suggesting acquisitions.

Claudia Lamas Cornejo: Thank you very much!

The interviewer was:

Claudia Lamas Cornejo
Head of Public Rrelations & Fundraising

In Conversation with... Martin Grewe & Stefan Zachow: The 3D Mimicry Archive



The surface of the face is first reconstructed from the photos as a 3D point cloud. The experts then project the texture of the surface of the face from the photos onto the 3D model. (Illustrations: Martin Grewe | ZIB 2014)

Since 1999 the Zuse Institute Berlin (ZIB) in Berlin-Dahlem has been working on and conducting research into plastic and reconstructive facial surgery. A 3D portraiture process has been newly developed to enable facial expressions to be reconstructed in three dimensions. The prototype of a 3D photo studio – the »camera facialis« – was set up for future research purposes. The *CZ#* here interviews Martin Grewe and Stefan Zachow as they prepare for their Long Night of Science presentation on 10 May 2014.

Claudia Lamas Cornejo: The »Epistemic Reverse Side of Instrumental Images« is one of six Interdisciplinary Laboratory base projects that are being presented next Saturday on the Long Night of Science. What can visitors see here at the Zuse Institute on 10 May?

Martin Grewe: We are presenting our 3D portrait photo studio, the »camera facialis,« which features a special camera set-up for 3D photography.

Stefan Zachow: »camera facialis« basically means portraiture chamber. By that we mean not the camera itself but the room because, in contrast to an ordinary photo studio with one photo camera, it contains six. There are three pairs of stereo cameras with lighting, seat and background. The aim of this chamber is to capture the faces not just as a photograph but three-dimensionally.

Martin Grewe: What happens there can be compared with the visual and perceptual behaviour of a human who sees with two eyes and the resulting parallax. In other words, we have not one image from one angle but two of each: stereo pairs of pictures. By photographing an object from different perspectives with two cameras in each instance we can reconstruct depth and, in the final analysis, three-dimensionality.

Claudia Lamas Cornejo: In the »Epistemic Reverse Side« base project you are representing the Zuse Institute's contribution. Which further research activities of yours are flowing into the base project?

Martin Grewe: In addition to setting up the 3D face studio we are working on a mimicry archive in 3D. Many different faces are to be included in order to provide information about the morphology, or the form and texture, of a facial expression. Our aim is to incorporate the widest possible range of variations in facial expression in this mimicry archive in order to conduct research by means of statistical analysis into the characteristic features of, say, laughing and how facial morphology typically changes when we laugh. The present set-up of the 3D face studio is the vehicle for future data acquisition.

Claudia Lamas Cornejo: Does that mean the 3D face studio is being tested on a larger scale for the first time on the Long Night of Science?

Stefan Zachow: Yes, we want lots of visitors to join in and allow themselves to be photographed for our scientific study. At first we will not be able to say much about the characteristics of the faces in question because the database is in its early stages and we need to measure many faces in order to do any statistics at all. The Long Night of Science is an important starting point for us. What we will be happy to show visitors are the 3D reconstructions of their faces. They will then be welcome to take them with them in digital form.

Claudia Lamas Cornejo: What will your next steps then be?

Martin Grewe: In setting up the 3D mimicry archives we hope to be able to find out by means of surface details what the characteristic features of a face are when people make a face. That has not yet been possible in 3D. What we are then interested in is finding signatures, or descriptive features, for specific kinds of mimicry and then classifying them in collaboration with the Centre for Literary Research, where Ms. Weigel has long been engaged in work on facial expressions and the aspects by which mimicry is evaluated. Together we would like to establish more objective standards for assessing facial expressions than have hitherto be available by means of, say, physiognomic or forensic interpretation.

Claudia Lamas Cornejo: Finally, a quick look back. How did the Zuse Institute get involved in mimicry research?

Stefan Zachow: We have been researching plastic and reconstructive facial surgery since 1999. We began by designing planning tools for doctors to help make it possible to plan and estimate how a face would look after complex facial surgery if, for example, bones are lengthened. The question that then quickly arose was what a mimic looks like in a face that has undergone surgery and how it changes. After a phase in which we modelled facial muscles elaborately and often only by assuming the existence of a contrasting musculature beneath the surface of the face, the idea took shape that we could learn for the modelling process by observing mimicry and could use what we observed and apply it to individuals. By setting up the mimicry database one of our objectives is to generate mimicry codes and apply them to patients in order to find out how a face must be change so that the patient smiles credibly or what effect the new face has on an observer when making different facial expressions. We are convinced that we will be able to do so with the aid of our 3D mimicry archive.

Claudia Lamas Cornejo: The CZ# wishes you many visitors and participants to build the mimicry archive!

The »Epistemic Reverse Side of Instrumental Images« base project presents itself and its 3D Face Studio on 10 May from 5 to 12 pm at the Zuse Institute Berlin, Takustrasse 7, 14195 Berlin-Dahlem.

The interviewer was:

Claudia Lamas Cornejo
Head of Public Rrelations & Fundraising

Review of Events

Long Night of Science, 10.05.2014

The *Interdisciplinary Laboratory* took part in the 2014 »Long Night of Science« at two locations.

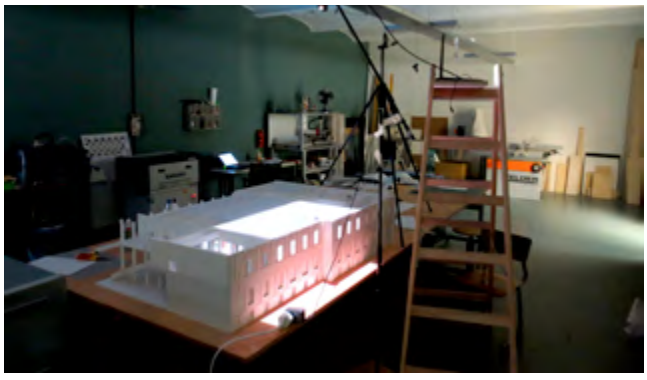
Date: 10 May 2014, 5–12 pm
Location 1: Hermann von Helmholtz-Zentrum für Kulturtechnik, Unter den Linden 6, third floor

Shaping Knowledge
The base project presented its »Speaking Images – Speaking of Images« exhibition, which had previously been on show in the foyer of the Jacob-und-Wilhelm-Grimm-Zentrum and investigates the scientific use of images at the Image Knowledge Gestaltung Interdisciplinary Laboratory.

Indexing Exhibitions
Opening up an exhibition is work that is undertaken in seclusion. Many pairs of hands and eyes record, describe, contextualise and preserve the smallest details of great works of art before they are presented to the public. That was why the base project opened its cellar doors slightly to invite visitors to get an idea of the work that goes on behind the pictures.

Virtual & Real Architecture of Knowledge
The Humboldt Laboratory makes research and teaching in the sense of an open university visible for a wider public. As an open lab it is an interdisciplinary research workshop where every day is an Open Day. The »Virtual & Real Architecture of Knowledge« base project exhibited a multimedia model of the future Humboldt Forum.

Gender & Gestaltung
The »Gender & Gestaltung« base project was represented by art history. Sophia Kunze presented visitors with pictures in which gender and its Gestaltung occupied a strangely central position and thereby invited them to think, guess and discuss. Visitors' attention was directed to the (subtle) Gestaltung of gender, making the relevance of this process understandable for the present as well as the past.



A model of the future exhibition room in the Humboldt-Universität zu Berlin's Humboldt Forum (Photo: Fabian Scholz | BWG 2014)

Attention & Form
The »Attention & Form« base project was represented in the Long Night of Science by the psychology and biology. Antonia Reindl demonstrated psychological experiments. The biologist Carola Becker illustrated the central question of collaboration between psychologists and biologists in terms of biological categorisation (»Lobster or Crab?«), inviting visitors to the Long Night of Science to »have a guess«.

The ***Interdisciplinary Laboratory Workshop*** presented itself with its 3D printer and scanner.

Location 2: Zuse Institute Berlin (ZIB) Room 2024, Takustrasse 7, 14195 Berlin-Dahlem

Epistemic Reverse Side of Instrumental Images
By means of stereophotogrammetric processes a three-dimensional image can be reconstructed from photos taken simultaneously. A six-camera set-up with which faces were photographed in 3D could be seen in action. They were used to create a digital archive of mimicry in order to analyse facial expressions by means of statistical methods. The results are used in areas such as psychology and medicine. They help us to understand commonalties and differences between facial expressions better.

www.langenachtderwissenschaften.de

Photo Spread of the »Long Night of Science 2014«

Jan-Hendrik Olbertz opened the VIP tour with an introduction to the *Interdisciplinary Laboratory*'s objectives.

The Humboldt-University´s President was one of those who had his 3D portrait taken by the Model Workshop and exhibited in the course of the evening as a 3D print.

Visitors were able to follow a 3D scan on a screen in real time.

Rico Haas, a student assistant in the »Attention & Form« base project, explained to visitors the state of biological research on species differentiation between lobsters and crabs.

Fabian Scholz's media-playable model of the future Humboldt Forum was the subject of interested enquiries.

Emilia Sleczek explained the aims of »Opening Up a Collection« with a QR code-accessible inventory and research database to simplify work on collections of paintings.

Potos: Sophia Gräfe | BWG 2014

Struktur
Gewebe
Oberfläche

Ringvorlesung des *Interdisziplinären Labors Bild Wissen Gestaltung*
Sommersemester 2014, Mi 18–20 h
Dorotheenstraße 26, Hörsaal 2.07

16. April: Horst Bredekamp Institut für Kunst- und Bildgeschichte, HU Berlin

30. April: Peter Fratzl Max-Planck-Institut für Kolloid- und Grenzflächenforschung

14. Mai: Carola Zwick studio 7.5 | Kunsthochschule Weißensee

28. Mai: Oliver Hahn Bundesanstalt für Materialforschung und -prüfung

11. Juni: Susanne Muth Institut für Archäologie, HU Berlin

25. Juni: Gerhard Scholtz Institut für Biologie, HU Berlin

09. Juli: Wolfgang Coy Institut für Informatik, HU Berlin

16. Juli: Wolfgang Schäffner Institut für Kulturwissenschaft, HU Berlin

▲ Abstandsgewirke, Kerstin Kühl, 2013

BORDER STUDIES

Europas Grenzen im transnationalen Vergleich (2)

Ringvorlesung: BA / MA, 2 SWS, Sommersemester 2014

Mittwoch 18–20 h

Dorotheenstraße 26, Hörsaal 208 (2. Stock) Der Zugang zum Hörsaal ist barrierefrei.

Veranstaltungsleitung: Prof. Dr. Claudia Bruns (Institut für Kulturwissenschaft)

▲ Foto: D. Glover / Creative Commons

23. April: Claudia Bruns, Markus Heide, Marietta Kesting Begrüßung und Einführung in Border Studies

30. April: Silja Klepp Frontex zwischen Flüchtlingsschutz und Grenzkontrolle. Eine ethnographische Perspektive

07. Mai: Bettina Uppenkamp „Insel der Hermaphroditen". Der Hof Heinrich III. von Frankreich.
Abendvortrag zum Workshop: „Der Körper des Kollektivs. Figurationen des Politischen in der Frühen Neuzeit".
Workshop des Basisprojekts „Gender und Gestaltung" am Do., 8. Mai 2014 an der Humboldt-Universität zu Berlin (R 2103)

14. Mai: Vassilis Tsianos Digitale Deportabilität, transnationale Akteur_innen Netzwerke und die flache Ontologie der mobile Commons: Zur intersektionellen Ethnographie der digitalen Grenze

21. Mai: Torsten Heinemann Verdächtige Familien: DNA-Tests für den Familiennachzug

04. Juni: Henrice Altink Genders and Borders: Mapping a New Interdisciplinary Field

11. Juni: Sabine Hess Das Geschlecht des Humanitarismus: Die europäische Grenzpolitik aus gendertheoretischer Perspektive

25. Juni: Marie-Hélène Gutberlet Grenzen des Sichtbaren. Ein Vortrag mit Filmbeispielen

02. Juli: Ana Manzanas-Calvo Border Theory: A Comparative Perspective

09. Juli: Brigitta Kuster Die Überquerung filmen

16. Juli: Claudia Sadowski-Smith Immigration, Violence and Gender at the US-Mexico Border

Forthcoming Events May–August 2014

From 16.04.2014 on alternate Wednesdays fro 6–8 pm | *Interdisciplinary Laboratory* Lecture Series | Dorotheenstrasse 26 | Hörsaal 2.07

In the lecture series on the key subject of »Structure – Tissue – Surface« the form and visibility of surfaces and structures are to be investigated in natural, textile, art and cultural history contexts. The aim is to establish which views, insights and perceptions reciprocally contribute to a reconsideration of structures in science, culture and the arts, the social sciences and the design disciplines and which synthesis can be formulated and shaped.

From 23.04.2014 | Wednesdays 6 to 8 pm | Border Studies II Lecture Series | Dorotheenstrasse 26 | Hörsaal 2.08

Over the past two decades work on borders has come to be seen as a central international issue. Serious scientific interest has been inspired by the processes of globalisation, which may have made some borders more open but have also contributed to further hardening of borders such as those between North and South on Europe's external borders or between the United States and Mexico. While Border Studies began by concentrating on research into international borders, symbolic borders have now come in for scrutiny too. Borders are no longer seen as national borders but as forms of discursive practice and visual production of meaning that generate and shape experience. Along with post-colonial, difference-theoretical and representation-critical question on the subject of binary border formations, the lecture series seeks primarily to focus on interrelationships between territorial and other symbolic – sexualised and racialised – border constructions.

14.–18.07.2014 | Interdisciplinary Summer University for Children | Sophienstrasse 22a

From 14 to 18 July the Cluster of Excellence *Image Knowledge Gestaltung* is holding a second *Interdisciplinary Summer University for Children*. The Summer University gives children aged between about 10 and 15 an insight into the Cluster's different research areas and with it a look behind the scenes of science and research. Applications by e-mail to bwg.kindersommeruni@hu-berlin.de please.

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