

**Session 149 — SCIENCE+ART=CREATIVITY: Libraries and the New Collaborative Thinking — Art Libraries with Science and Technology Libraries**

19 August 2014 16:00 - 18:00 | Room: Amphithéâtre | SI

- **Introduction**  
JAMES L. MULLINS (Purdue University, West Lafayette, IN, United States)
- **Buildings with brain power: library architecture in neural terms**  
HANNAH BENNETT (Princeton University Library, Princeton, NJ, United States)
- **Integrating science and art: the scriptospatial visualization interface**  
FENELLA G. FRANCE (Library of Congress, Washington, DC, United States) AND MICHAEL B. TOTH (R.B. Toth Associates, Oakton, VA, United States)
- **Crash boom bang your way into the world of arts, technology and sustainability**  
JANE GRACE (Yarra Plenty Regional Library, Melbourne, Victoria, Australia)
- **Art of Life: merging the worlds of art and science**  
TRISH ROSE-SANDLER (Missouri Botanical Garden, St. Louis, MO, United States), NANCY E. GWINN (Smithsonian Libraries, Washington, DC, United States), and CONSTANCE RINALDO (Ernst Mayr Library, Harvard University, Cambridge, MA, United States) and
- **Science and art meet technology and business: service design methods and the future Learning Center at Aalto University**  
EILA RÄMÖ (Aalto University Library, Aalto, Finland)

Promoting creative synergies between the arts and sciences is the motivation for STEM to STEAM initiatives in many countries. When coupled with the arts, the STEM disciplines--science, technology, engineering, and math--are empowered and STEM expands into STEAM. On the other side of the equation, artists, designers, and curators are witnessing the revolutionary impact of scientific thinking on their modes of practice. This session highlights collaborations between art practitioners and scientists as well as the library collections and services that support the intersection of these two spheres.

**Moderator:** SANDRA LUDIG BROOKE (Princeton University, Princeton, NJ, United States)

## ABSTRACTS

### **Buildings with Brain Power: Library Architecture in Neural Terms**

**Hannah Bennett**

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#### **Abstract:**

*The connection between neuroscience and the built environment is a fairly new interdisciplinary field and one in which both fields, in their respective pursuits, have worked to understand the relationship between design choices, human behavior, and biological processes. Taken together and applied in tandem, these two activities have potential to vastly improve the effectiveness of buildings designed with the healthcare facilities, laboratories, or elementary schools, all of which share objectives of healing and intellectual cultivation.*

*This paper will extend the dialogue to library design, perhaps the most representationally loaded expression of “mental space.” The library has seen profound changes in its core program with contemporary expectations of the library looking for wireless “anywhere” environments, cafes, group study spaces, and some stacks. Designs aiming to meet these new requirements seek to accommodate the behavior of the person using the library – as opposed to programming for specific, more traditional behavior - in that the space is open and extensible. This is an historic shift for library design, with as many critics as advocates.*

*To help frame the discussion of how neuroscience and library design could inform each other, I consider the “productive research environment” (a term borrowed from the social sciences) as it relates to library spaces and programming. It is not clear how these “web 2.0” advances in physical space have impacted the researcher’s process or thinking in neural terms. At the same time, neuroscientists should consider the representational aspects of architecture, as well as its functional requirements. In doing so, the dialog of neuroscience and architecture has potential to reinforce in new ways the spirit of learning and research that libraries have historically tried to embody.*

## **Integrating Science and Art: The Scriptospatial Visualization Interface**

### **Fenella G. France**

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### **Michael B. Toth**

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### **Abstract:**

*Advances in technology and digital access have improved utilization and interpretation of scientific analyses for cultural heritage and humanities studies. Integrating scientific and curatorial knowledge (STEM to STEAM) is a critical multidisciplinary approach. Researchers have exposed previously unknown contextual information within original materials, such as changing “subjects to citizens” on the Rough Draft of the Declaration of Independence. Using hyperspectral imaging, researchers provide new data layers by capturing images of documents in distinct wavebands of the visible and non-visible spectrum. Spectral imaging at the Library of Congress also allows integration of data from other non-invasive analytical techniques to map objects analytically.*

*Digital imaging capabilities allow researchers to characterize pigments and inks on the object, retrieve lost text, and illuminate creation methods. Captured data provides access to information from fragile historic documents, including the 1507 Waldseemüller World Map and 1513 Ptolemy Geographia. Investigations revealed links to the same printing location. “Scriptospatial” refers to a global information system approach for documents, creating an interactive interface for scholars and scientists to engage with object data. Viewing digital cultural materials in multiple dimensions applies an archaeological approach, uncovering and interconnecting information strata of unique documents. Utilizing an object-oriented approach in conjunction with the data layer allows mapping of spatial and temporal data with increasing complexity for direct sharing and visualization of data. This scriptospatial concept enhances the ability to support cross-disciplinary research collaborations and analyses. These relationships support valuable and innovative creative approaches to data integration, while strengthening effective art and scientific collaborations.*

## **Crash boom bang your way into the world of arts, technology and sustainability.**

### **Jane Grace, Manager Community Engagement**

Community Engagement Department, Yarra Plenty Regional Library, Melbourne, Australia

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#### **Abstract:**

*This paper explores the planning and implementation of a technology and arts based education program at Yarra Plenty Regional Library. The program is designed to foster partnership opportunities with local educational institutions and increase the use of creative resources in the library. It is based at the Mill Park branch where the recently opened Maker Space offers new, innovative, state-of-the-art technology for people to use and create. There is technology in the space to create electronics projects, video making and editing and stop motion animation.*

*This paper will describe one particular project, r'Orchestra, which incorporates aspects of programming; fine motor skills, music and design. It is an interactive technology and arts development workshop program where students are tasked with inventing musical instruments using recycled materials and Makey Makey devices. By combining Makey Makey invention kits with creativity, students are introduced to the broader applications of sciences such as programming and engineering in a real-world context. A broader objective of the r'Orchestra program is to increase the use of the Mill Park Library Maker Space and its resources by school groups. It also develops the student's ability in communication skills, digital fluency, innovation, problem resolution, creativity and collaboration.*

*The presentation will describe how the project was developed and implemented and the outcomes that have been achieved. It will suggest criteria for selecting and implementing appropriate, sustainable technologies in library spaces to maximise access and exposure to new and useful digital tools in the community.*

## **Science and Art meet Technology and Business: Service Design, Go-design and the Future Learning Center at Aalto University, Finland**

**Eila Rämö**

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### **Abstract:**

*Aalto University operates on three campuses in two cities, Helsinki and Espoo (Finland) and consists of six schools: School of Chemical Technology, School of Electrical Engineering, School of Engineering, School of Science, The School of Business, and School of Arts, Design and Architecture. The University will centralize its operations gradually to one campus area meaning that also the three campus libraries will move to same area and form a joint Learning Center.*

*The Otaniemi campus library (= former Library of the University of Technology, library building designed by Alvar Aalto.) will be fully renovated to cater for the demands of a modern learning center. The versatile library services will get further support from new services and spaces that will support different ways of studying and working. After the renovation, the library will offer a modern and dynamic space, supporting the Aalto University spirit of multidisciplinary learning, research and working methods.*

*Planning of the Learning Center and center's services has been based on service design methods. In my paper I will present the service design process and the results of the process. The other half of the paper covers co-design methods used when building up the Learning Hub network. The Learning Hub network serves as a series of prototypes of Aalto University Learning Center.*

## **The Art of Life: Merging the Worlds of Art and Science**

### **Trish Rose-Sandler**

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### **Constance Rinaldo**

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#### **Abstract:**

*This paper shows how a digital library, created primarily for the use of biologists, is reaching a broad audience of artists, art historians, exhibition and graphic designers, publishers, and others in humanities fields, thus merging the worlds of science and art.*

*Created by a global consortium of natural history, botany, agricultural, university and national libraries, the Biodiversity Heritage Library (BHL) is a rich domain repository of historic biodiversity literature. Providing open access to over 43 million pages of text (approximately 140,000 volumes) via its portal (<http://www.biodiversitylibrary.org/>), the BHL has developed into an essential research tool for biologists around the world.*

*Within these texts, but not easily accessible, are millions of visual resources, plates, figures, maps, and photographs, many produced by the finest botanical and zoological illustrators in the world, such as John James Audubon, George Dionysus Ehret, and Pierre Redouté. When BHL staff began to duplicate the beautiful plates in these volumes to a Flickr site, now containing 90,000 images, its popularity made clear that the BHL work could attract an audience far outside the scientific world. There was also a need to automate the identification process and create relevant metadata, a laborious procedure that currently requires significant staff time.*

*In 2012, the Missouri Botanical Garden embarked on an ambitious project to automatically identify and describe all natural history illustrations in BHL texts, not just the plates, in order to make them more easily accessible and able to be shared with other repositories, such as ARTstor, Encyclopedia of Life, and the Digital Public Library of America. This paper describes the project and shows how scholars, educators, designers—and image lovers—will be able to find and view a wealth of illustrations of plant and animal life from which to make connections between science, art, culture, and history.*