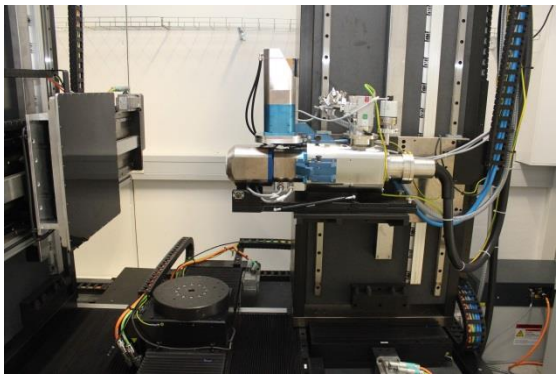
MUSICES – MUSical Instrument-Computed tomography Examination-Standard

Fact Sheet

The Germanisches Nationalmuseum (GNM) is one of eight research museums within the German *Leibniz Gemeinschaft* and is home to an important collection of historic musical instruments. The conservation workshop of the museum's *Institut für Kunsttechnik und Konservierung* (Institute for Art Technology and Conservation) was among the pioneers in the radiography of musical instruments in the 1970s and among the first users of three-dimensional computed tomography (3D-CT) in the same field in 1988. With funding from the *Deutsche Forschungsgemeinschaft,* the museum and the *Fraunhofer Gesellschaft* Institute for Integrated Circuits (IIS), Development Center for X-ray Technology (EZRT), will create the examination standard MUSICES. The Fraunhofer EZRT has been working for over ten years in close collaboration with the chair for X-ray microscopy at the University of Würzburg. The main working areas are research and development of new X-ray examination methods for industrial use within the areas of characterization of materials, process-integrated examination of construction parts and non-destructive measuring technology. Project targets are:

1. A device-independent description of technical parameters for 3D-CT imaging of various materials, object sizes and material combinations in musical instruments.
2. Description of open formats for the long-term archiving of high-resolution master scans.
3. Description of open formats for derivatives, for presentation on the web and the dissemination as open access.
4. Definition of minimum resolutions of 3D-CT scans for different types of instruments depending on size, material and potential applications.
5. Definition of details to be scanned more precisely for different types of instruments, particularly for larger instruments, when it is not useful or feasible to make a high-resolution total scan.



6. Definition of the necessary metadata for 3D-CT scans, compatible with LIDO and MIMO-LIDO respectively and with the ISO standard CIDOC-CRM (ISO 21127:2006).
7. Integration of the metadata and the generated 3D-CT scans into MIMO. Transfer to EUROPEANA via harvesting.
8. A standard paper to be at DFG's disposal and supplementing the MIMO digitalisation standard.
9. A best-practice paper according to the MIMO digitisation standard.

Project progress information will be published in a newsletter.

Key data:

Funded by Deutsche Forschungsgemeinschaft
Project running time: 1.11.2014 – 31.10.2017
Project website: http://www.gnm.de/forschung/forschungsprojekte/musices/

Project partners:

Germanisches Nationalmuseum, Nürnberg

Dr. Frank P. Bär (Project Director) is Head of the Musical Instrument Department, of the Research Services Department and the Photo Department. Within the Core Management Group of the MIMO project, he serves as the contact person for digitisation issues and for collections in the United States and the German speaking area. He is one of the German representatives in the COST action FP1302 WOOD MUSICK.

Dipl. Rest. Sebastian Kirsch M.A. studied literature, art history and theatre science in Munich, Würzburg and Trondheim, as well as conservation science at the *Akademie der Bildenden Künste* in Vienna. In the MUSICES-Project he is scientific collaborator and project manager.

Dipl. Rest. Markus Raquet trained as a brass instrument maker and studied conservation science, with a focus on musical instruments, at the *Fachhochschule für Technik und Wirtschaft* in Berlin. He has published several articles about the use of digital examination methods in musical instrument conservation.

Dipl. Rest. Meike Wolters-Rosbach trained as a piano maker with Steinway & Sons in Hamburg and studied conservation science at the University of Applied Sciences in Potsdam. In the MUSICES-project she works as art-technologist.

Fraunhofer-Institut Integrierte Schaltungen, Entwicklungszentrum Röntgentechnik, Fürth

Dr. Theobald Fuchs (Project Director) is chief scientist at the Fraunhofer Entwicklungszentrum Röntgentechnik in Fürth. After having graduated as a physicist, he took his doctorate in the area of 3D computed tomography at the University of Erlangen. Since 2010 he has taught physical foundations of image and signal processing at the Julius-Maximilians-University in Würzburg.

Dipl. Ing. (FH) Christian Kretzer is leader of the application group at Fraunhofer Entwicklungszentrum Röntgentechnik in Fürth. He studied engineering with a focus on product development at the Technical University in Nürnberg. Since 2009 he has worked for the Fraunhofer Institute within the section process-integrated inspection systems, and automated x-ray inspection systems. Since October 2012 he has acted as group leader.

Dr. Rebecca Wagner is working at Fraunhofer Entwicklungszentrum Röntgentechnik in Fürth since 2015. She studied physics at Chemnitz University of Technology and did her PhD at Leipzig University on methods for the investigation of photonic crystals. In the MUSICES project she is a scientific collaborator.

Dipl. Ing. (FH) Gabriele Scholz has worked for Fraunhofer Entwicklungszentrum Röntgentechnik in Fürth since 2009. She studied applied chemical science at the *Technische Universität* in Berlin. Within the area of application-specific methods and systems of EZRT she conducts CT-measurements. Since the end of 2014 she has worked as part of the application group.

Co-proposers:

- Musikinstrumenten-Museum, Staatliches Institut für Musikforschung Preußischer Kulturbesitz, Berlin, Prof. Dr. Conny Restle (web site)
- Staatliche Museen zu Berlin – Ethnologisches Museum, Prof. Dr. Lars-Christian Koch (web site)
- Museum für Musikinstrumente der Universität Leipzig, Prof. Dr. Josef Focht (web site)

Cooperation partners:

- Musée des instruments de musique, Brüssel (B) (web site)
- University of Edinburgh (UK) (web site)
- Philharmonie de Paris (Musée de la musique) (F) (web site)