The Nabeshima ware was Japanese porcelain produced in Arita,Saga Prefecture, under the feudal load of Nabeshima,in Edo period for some 200 years until 1871. The original form of it is Imari ware,exported to Europe. Since the Nabeshima ware was produced by a clan klin, it was not sold and used mainly as gift among shougun and feudal loads. The patterns are investigated by symmetry, chiefly in two dimensions using point group,plane group and color group. Some dishes show *16*, *8mm* symmetry, and Seikaiha *cm*, Shitihoutunagari *p4mm, c2mm* or *p6mm* and Bishamon *p31m*. Here one example of tri-color group is shown. It is Iroe bishamon-kikkou monnyou sara, Nabeshima, 17-18C. It is trigonal *p31m* as monocolor and tri-color *R3m* symmetry, derived by Belov et al.(1964 Shubnikov). In this conference, some photos and symmetrical aspect will be shown. I thank Toguri Museum of Art,Tokyo and Dr.Yumi Mori of it for giving photos and information of Nabeshima ware.

Keywords: symmetry, color group, plane gruop

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Periodic motives and crystallographic topics in contemporary art, design, and architecture

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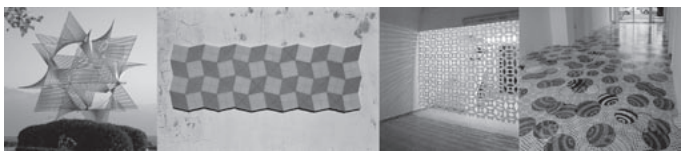
Since the beginning of humanity visual researchers, artists and scientists, are exploring symmetry and its applications. Today, after more than one century of separation, the relationships of the arts and the sciences are reconsidered, and fruitful collaborations are emerging. Today's scientific topics, methods, and tools are part of the artists' world, and the scientific community explores intensively art work, such as Islamic patterns or traditional textiles, too. Working as a visual artist and scientist, I wish to share with you my insight into both of these worlds. I will present aspects of contemporary artists, designers, and architects, related to crystallographic topics, such as 3D-periodic surfaces (Michael Burt, Peter Pearce, Angel Duarte, Marion Regitko), and the application of repetitive motives (Vreni Spieser, Rudolf Stingel, Samta Benyahia, Yinka Shonibare, Rahel Hegnauer, Samuel Fosso). Figures (left to right): Angel Duarte, E.4A. l. (Ouverture au monde), 1972-73, Lausanne, Switzerland. Rahel Hegnauer, Blau/Rosa, and Scherenschnitt, 2001, Rades, Tunesia. Vreni Spieser, installation, 2008, Berlin, Germany (Photographs: A. Zuern, R. Hegnauer and V. Spieser).



Keywords: art, design, architecture

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X-ray analysis of cultural heritage at museums by using portable instruments

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We have been developing a portable powder diffractometer and XRF spectrometer since 2001 jointly with two X-ray makers: i.e., Institute of X-ray Technologies Co. Ltd. and OURSTEX Co. Ltd., respectively. The instruments were brought to several museums as well as many archeological sites in Egypt, Turkey, Italy, etc. to characterize the cultural heritage and the results were reflected on their improvement. The instruments thus developed are suitable for on site analyses with enough sensitivity, accuracy, and durability. The latest version of our diffractometer (weight 15kg) adopted Si-PIN as a detector, which enable us to obtain EDX spectrum of the sample as well as a good powder diffraction pattern with low background. The XRF spectrometer (25kg) is equipped with SDD detector and monochromatic/white X-ray sources. Recently the Be window of the detector was replaced with MOXTEK AP3 polymer window and vacuum sample chamber was introduced to quantify Na and Mg. The instruments were brought to Archaeological Museum in Zadar, Croatia, Okayama Orient Museum and MIHO Museum in Japan. The samples are glass, pottery, metallic and stone objects dated from second millennium B.C. to modern. We have chemically characterized 109 Roman glass artifacts excavated at a Roman necropolis found in Zadar, and classified based on decolorants, impurity and vessel types. We have studied glass, faience, pottery and metal collections at the Orient Museum. The results include identification of cassiterite in glazed Islamic pottery. At MIHO museum, stone objects from China and Middle East were characterized by the diffractometer. The analyses were made as joint projects with S. Gluščević (Archaeological Museum), R. Shikaku (Orient Museum), Y. Azuma and Y. Kuwabara (MIHO Museum).

Keywords: nondestructive analysis, archaeometry, instrument development