## MS47-T01

**The symmetries of things.** Chaim Goodman-Strauss (Fayetteville, AR/US)

## MS47-T02

**Arabesques for Abu Dhabi - an octagonal system.** Jean-Marc Castera (Paris/FR)

## MS47-T03

**Quasiperiodic Symmetry in a Baroque Church in the Czech Republic.** Jan Fábry. *Institute of Physcis of the Academy of Sciences of the Czech Republic, Na Slovance2, 182 21 Praha 8*
E-mail: fabry@fzu.cz

In the architecture of the famous baroque Pilgrimage Church of St. John Nepomucen (built between 1719-1722; being on the UNESCO list of the World Heritage since 1994) and the surrounding surrounding Cloister on Zelená Hora close to Ždar nad Sazavou, Czech Republic (Architect: Johann Blasius Santini-Aichel) have been found elements of quasiperiodic symmetry: The plan is similar to Fig. *Aa* that shows a quasiperiodic pattern. This pattern has been invented by Johannes Kepler [1] while the central church can be envisaged as composed of three groupings of the prolate golden rhombohedra, the building elements of the three-dimensional Penrose tiling. This grouping of the prolate golden rhombohedra has been also described by Kepler in the same book when mentioning triakontahedron. Moreover, in peripheral parts of the church has survived original pavement composed of packed regular pentagons. The same pattern can be inset into the area of the church and the cloister. With regard to the early Santini's construction of the Chapel of St. Ann from 1705-1708 in Panenske Brezany can deduced that both constructions with elements of the so called baroque gothic [2] can be envisaged as expression of platonic philosophy in Christianity.

[1] Johannes Kepler. Harmonices Mundi. Secundus Architectonicus, seu ex Geometria Figurata, De Figurarum Regulatium Congruentia in plano velsolido. Linz (1619). Translated into German (Weltharmonik) with a preface by Max Caspar - München, Oldenbourg (1939), Germany. [2] Z. Wirth, Barokní gotika v Čechách XVIII. a 1. poloviny XIX. století (1908). Zvláštní otisk Památek archeologických a místopisných. XXIII. Praha. (in Czech) Baroque Gothic in in Bohemia in XVIII and the first half of the XIX Centuries. A special issue of the journal.

**Keywords: quasiperiodic symmetry, architecture, history**

## MS47-T04

**Classification of the Moroccan ornamental patterns constructed by the "Hasba" method.** Youssef Aboufadil, Abdelmalek Thalal, Jamal Benatia, Abdelaziz Jali, M. Ahmed Elidrissi Raghni. *Department of physics, LSM, Faculty of Sciences- Semlalia-Marrakech-Morocco.*
Email: fadil_youssef@hotmail.com

Moroccan ornamental art encompasses great achievements in 3-dimensional ornament (Mouqarnass) as well as in 2-dimensional (calligraphy, stylized floral designs, architecture and abstract geometric patterns). We are interested here in the plane ornamental art. There are two methods of construction used in the construction of Moroccan geometric patterns: the first one called *"Zellij"* method (fine mosaics) was described by Castera [1], the second one, the "Hasba" method (unit measure) is a geometric construction or "Tastir" rather used by craftsmen working on wood" [2], [3]. This method consists in tracing a grid with precise criteria of measurement. The framework used to draw the grid is generally square and rectangular one. The grid can generate several motifs. In this work we present all the patterns obtained for two value of Hasba h=16 and 24.5. Several patterns are originals, they were not known before our investigation. We then define the tools used to classify the achieved patterns: type of the framework, types of the unit cell (primitive or multiple) and the corresponding h and the symmetry group. We finally give some specific ornamental patterns (Fig. 1) and their classifications.

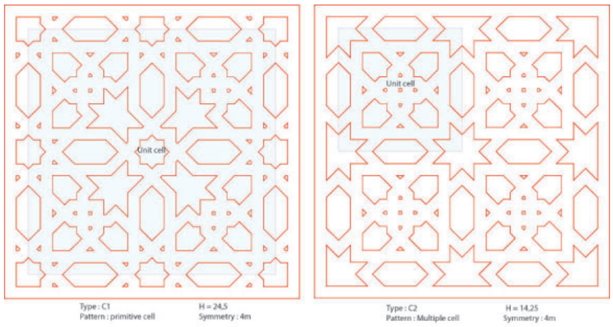


Figure 1: Classification of two patterns constructed by the same grid.

[1] Castera, Jan-Marc, Arabesques: Art Decoratif du Maroc Courbevoie: ACR, 1996. [2] A. Thalal, M. J. Benatia, A. Jali, Y. Aboufadil and M. A. Elidrissi Raghni, *Islamic geometric patterns constructed by craftsmen working on wood*. Accepted for publication in the Special Issue on Tessellations of the Symmetry journal Hungary –2010. [3] A.Thalal, J. Benatia A. Jali, *Analysis of the craftsman's approach to the Moroccan geometric patterns*. Acta Cryst. (2008). A64, C635.

**Keywords: symmetry, 'Hasba' or unit measure, classification**

## MS47-T05

**„Bossenstein" - unique ornamentation of "Weser-Renaissance".** Annegret Haake*, Jaminstr. 11b, 61476 Kronberg, Germany.*
Email: haake.xx-tex@t-online.de

Nowadays, „Bossenstein" is only in use for stones which are roughly processed at the surface. As such it is offered in the building trade. But the name which signifies something like "chip-carved stone" became a typical detail of the late North German Renaissance. The sandstone of this area – also called "Bremen stone" – was the ideal material for this technique. At the 2nd half of the 16th century stone-masons from South Germany moved to the North. The wars between the nobility (knights) and peasants in their home area had reduced the opportunity to work in their profession. They found work in the region of the river "Weser", where a special type of Renaissance architecture - called "Weser-Renaissance" - had been created. It is said that these artisans developed "Bossenstein" [1]. Using the local sandstone for frames of windows and gateways the stone-masons cut plane-symmetrical patterns into these frameworks - typical in "Weser-Renaissance". Only few exceptions are found in the Netherlands and Scandinavia. Many castles of the nobility as well as town halls and houses of rich merchants show these ornamentations. In general, the patterns follow the symmetries p1, pm, cm, p2, p2m, p2gm and p4m. The Thirty Years' War stopped the building activities, before the ornamentation could spread in other areas. Thus, it can mostly be found in the Weser region, from Paderborn to Bremen.

[1] Kreft, H. and Soenke, J.: Die Weserrenaissance (German). – C.W. Niemeyer, Hameln, 1986. [2] Kuster-Wendenburg, E.: Der Bremer Stein und die Weserrenaissance (German). – Fachbereich Geowissenschaften, Universität Bremen, 2002.

**Keywords: plane symmetry; symmetric art**