

EXHIBIT

Title: Symmetry in South African Crafts

Dr Chonat Getz, Department of Mathematics, University of the Witwatersrand,
Private Bag 3, Wits 2050, Johannesburg, South Africa
E-Mail: 036cgg@cosmos.wits.ac.za

Keywords: Symmetry groups, fractals, beadwork, basketry

This exhibit demonstrates some aspects of my research in the field of symmetry groups and fractal geometry as applied to South African crafts.

I present a selection of South African beadwork and basketry and an explanatory poster. The craft works illustrate the mathematical concepts of symmetry groups and self-similarity in fractal geometry with the poster elucidating the mathematics.

SYMMETRY GROUPS

Three categories are illustrated.

Cyclic and dihedral groups from the point category are recognized in colourful Zulu basketry (*izimbenge*) (see Figure 1).

Strip and plane symmetry groups are seen in many designs, such as beaded Ndebele and Tonga aprons (see Figures 2 and 3).

FRACTAL GEOMETRY

Examples of South African basketry and beadwork are used to demonstrate concepts in fractal geometry.

Self-similarity in the form of spirals, concentric stars and approximations to Sierpinski triangles are evidenced through various artefacts (see Figures 4, 5 and 6).

Algorithmic processes which make use of Iterated Function Systems are invoked to generate computer images of some of these designs.

FIGURES

Figures 1 to 6 are examples of the types of basketry and beadwork that will be on display.

SPACE REQUIREMENTS

I require a wall space of approximately 2m X 1m for hanging beadwork, a table on which to place baskets and beadwork, and space for a poster.

All of the beadwork is on loan from the Standard Bank and University collections of African art at the University of the Witwatersrand. The curator of the gallery, Rayda Becker, may also be attending.

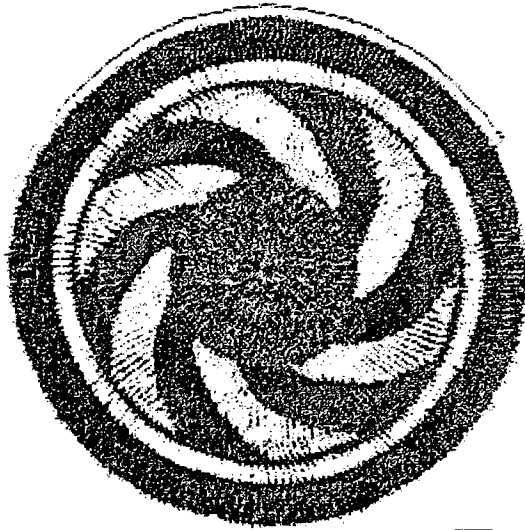


FIGURE 1 - ZULU *IMBENGE*
CYCLIC GROUP OF ORDER 6

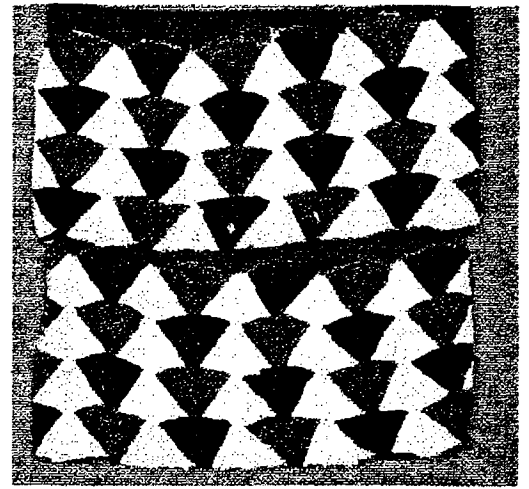


FIGURE 2 - TONGA *NDEKA*
PLANE SYMMETRY GROUP pm

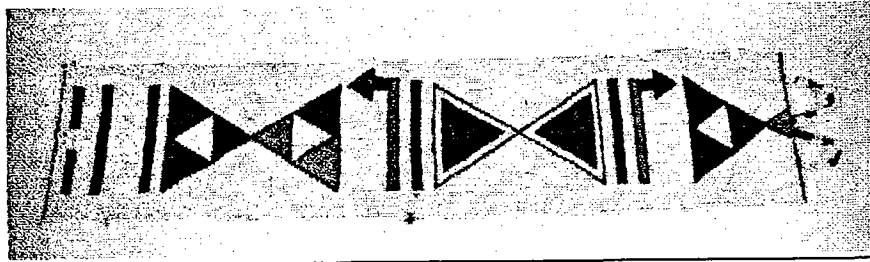


FIGURE 3 - NDEBELE BACK APRON COVER. STRIP GROUP $p2mm$

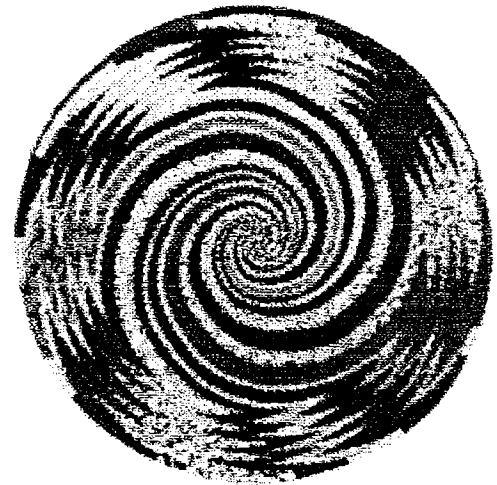


FIGURE 4 - SPIRAL *IMBENGE*

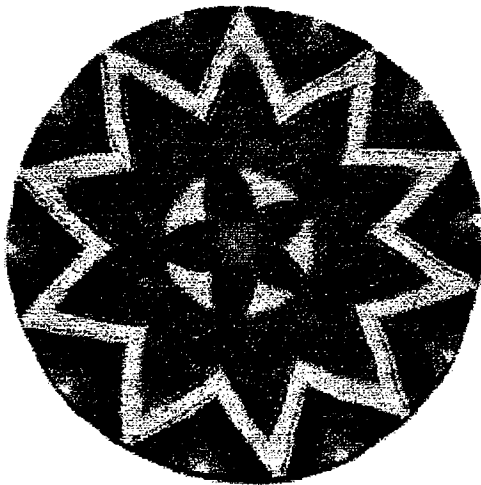


FIGURE 5 - STAR *IMBENGE*

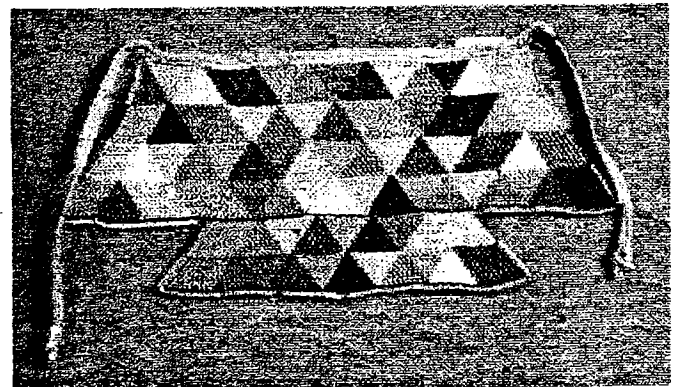


FIGURE 6 - NORTH SOTHO APRON