# Frustrated Ceramics

Arielle Blonder

Racah Institute of Physics, The Hebrew University HUJI

Shrinkage-rate of clay during firing varies according to clay-type. Fusing two layers of porcelain and stoneware for joint firing generates geometrical incompatibilities, or material frustration. An elastic solution is found by the flat sheet material through bending, self-shaping into predictable 3D shapes.

Reference-curvature is dictated principally by sheet thickness and differential strain.

Grooves in stoneware-layer enhance curvature by local mechanical release.

Grooves in porcelain-layer introduce anisotropy, changing curvature orientation.

Grooved stoneware

## While firing

Shrinkage 13%	'
Shrinkage 8%	

After the firing





#### Shira Shoval

Textile Design Department Shenkar College of Engineering, Design and Art Bezalel Academy of Art and Design

### Ofri Dar

Industrial Design Department

#### Eran Sharon

Racah Institute of Physics, The Hebrew University HUJI



Grooved porcelain



 $K = \mathcal{E}/t$ K - curvature **E** – strain t – thickness

150 mm

**Cutting pattern** of clay sheet



