

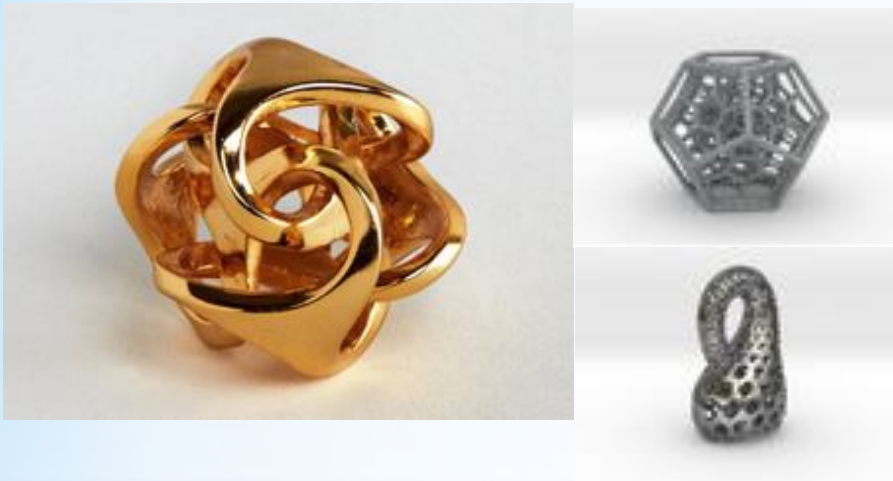
3D Printed Mathematical Art

Christopher R. H. Hanusa

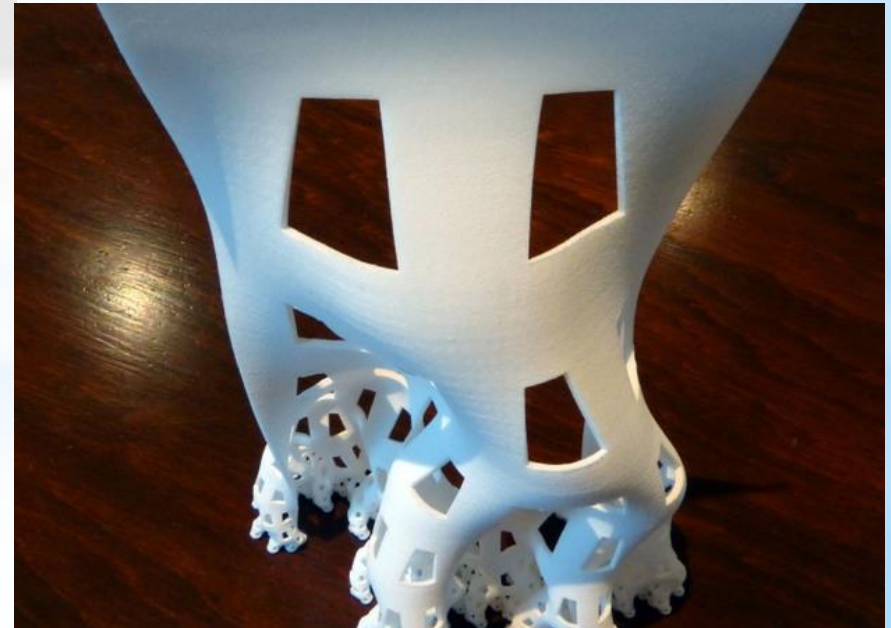
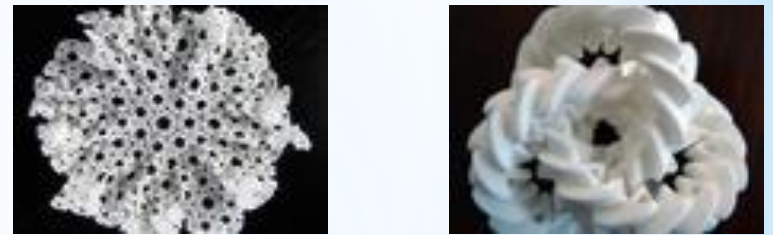
Queens College

Mathematics + Art ?

Bathsheba Sculpture

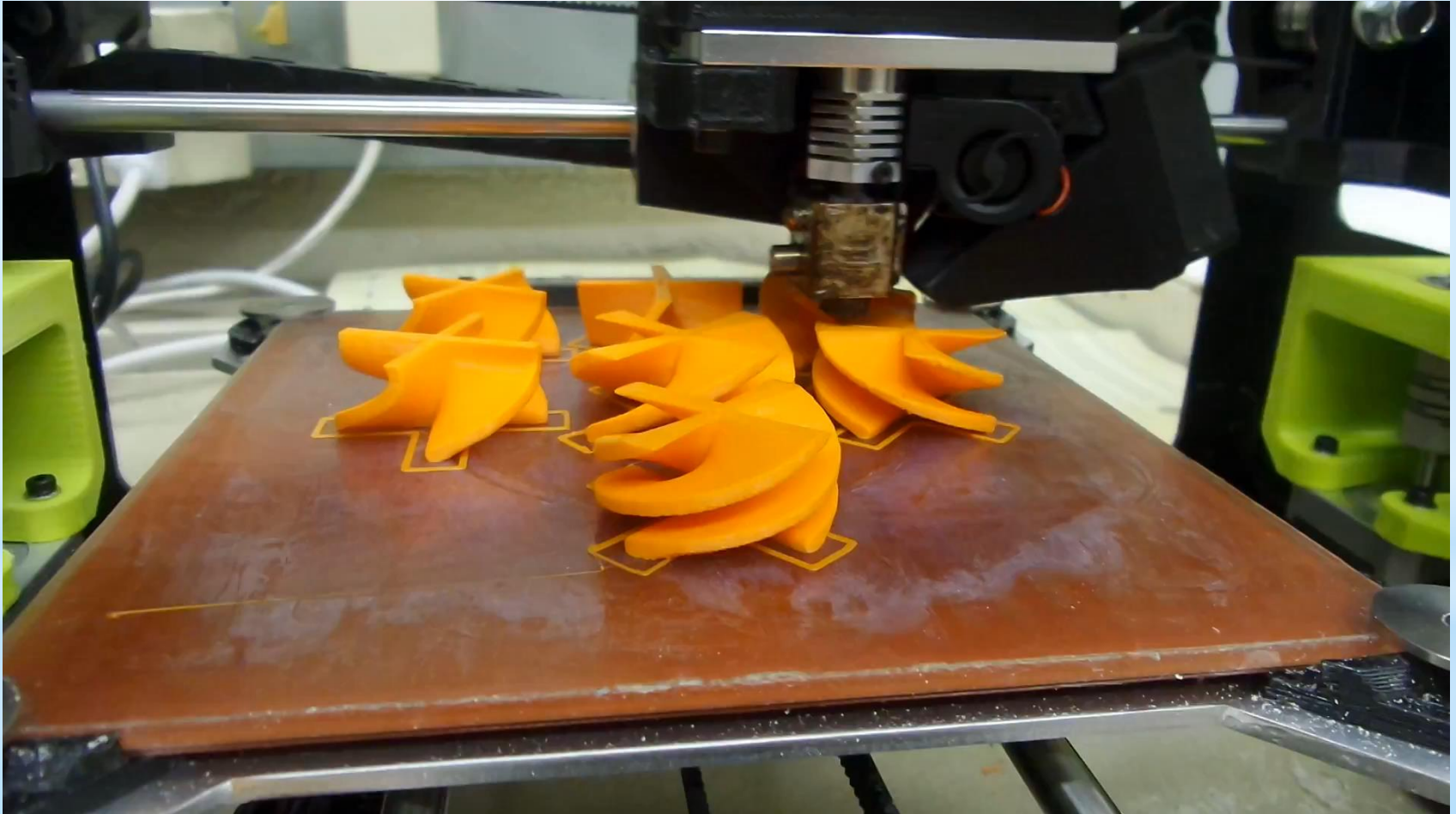


Henry Segerman



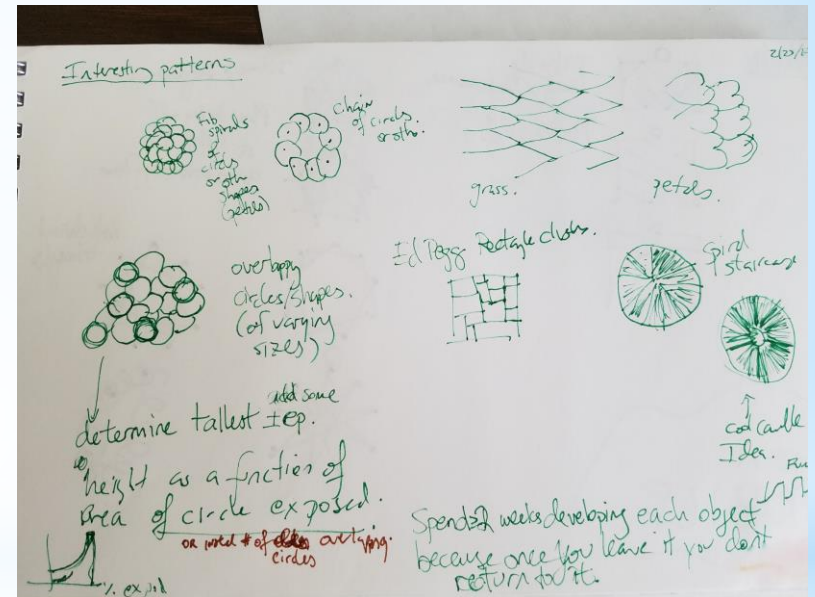
- Repetition
- Symmetry
- Geometry
- Higher Dimensions

What does 3D Printing look like?



3D Printing is not just printing

Concept

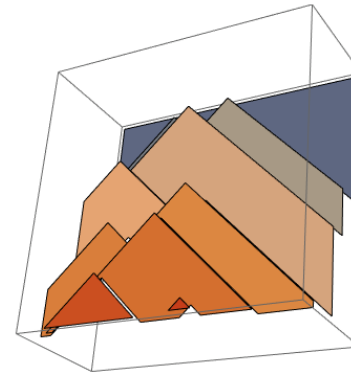


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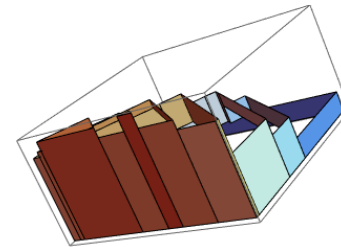
Concept

Design

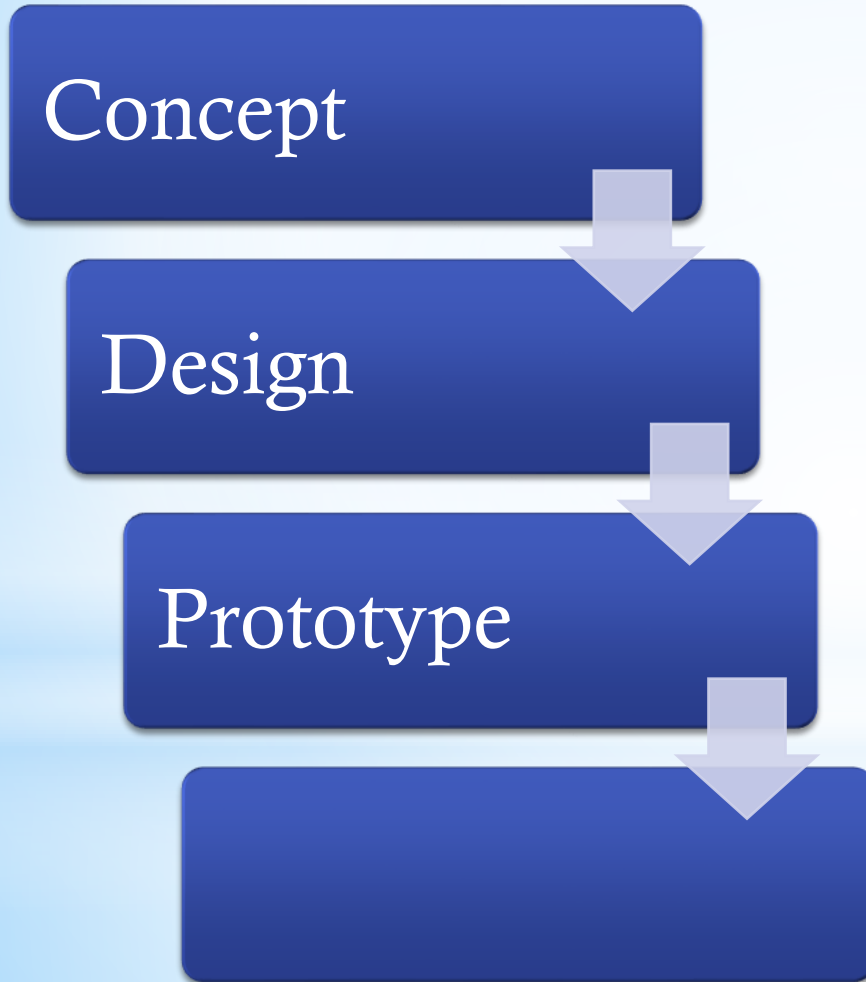
```
prims = MeshPrimitives[mesh, 2];  
f[x_, y_] := .5 - (y) / 2;  
fvals = Map[f @ RegionCentroid[#] &, prims];  
maxz = Max[fvals] + .1;  
minz = Min[fvals] - .1;  
flats = Graphics3D[Table[{ColorData["LightTemperatureMa
```



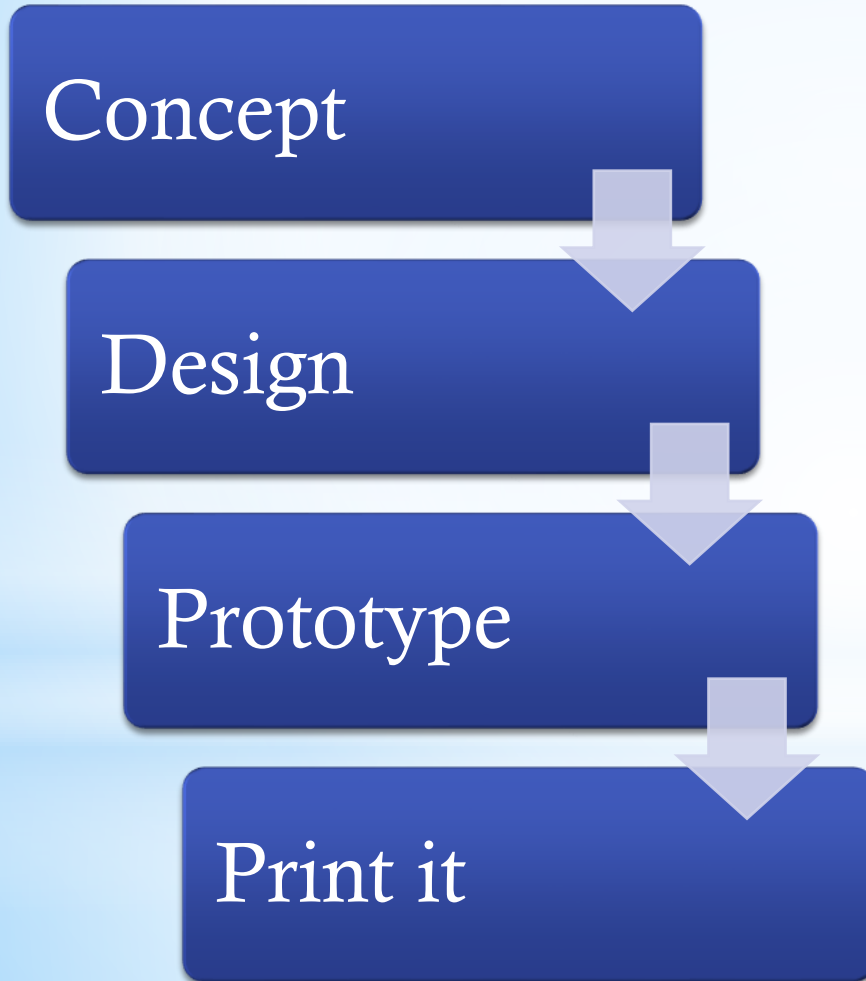
```
minz = Min[fvals] - .1;  
bdrys = Map[MeshPrimitives[BoundaryDiscretizeRegion[#,  
segs = MeshPrimitives[mesh, 1];  
polypairs = Map[Flatten[{Position[bdrys, #], Position[bdrys, #]}], bdrys];  
blankwalls = MapThread[RegionProduct[#1, Line[Transpose[polypairs, 2]]] &, {polypairs, bdrys}];  
walls = Graphics3D[Table[{ColorData["LightTemperatureMa  
First@MeshPrimitives[DiscretizeRegion[blankwalls[
```



3D Printing is not just printing



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At Queens College

- Art: Prof. Greco
 - Arts 282 - 3D Modeling/Printing and Slip Casting
 - Also: 3D Modeling (Intro & Advanced)

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 - Biology: Frog Model
 - Art History: 3D printed ancient sculptures
 - Dance: Costumes with LED Enclosures



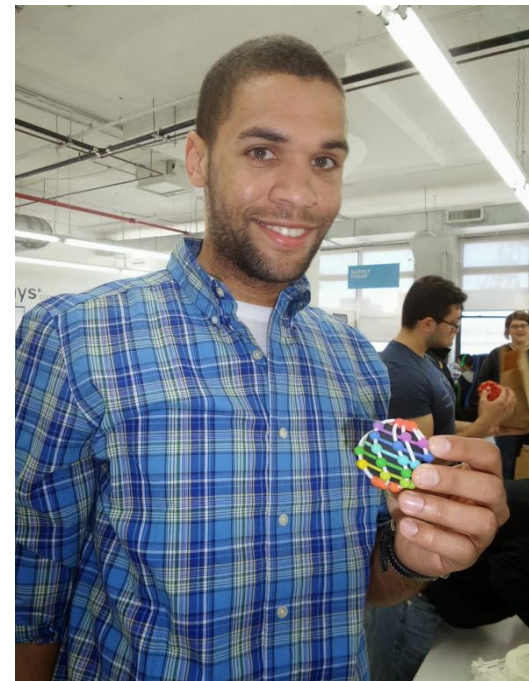
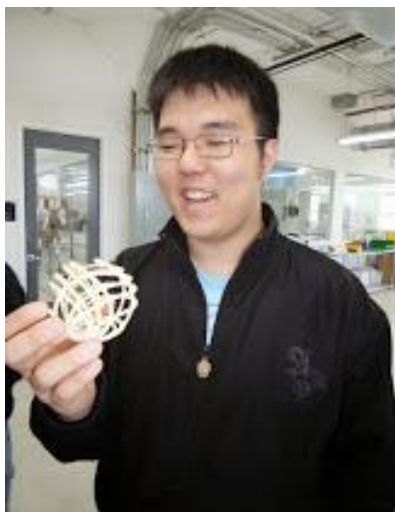
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 - Math: 142, 201
 - Printing parts: Physics CNC / Music Mic Part
 - Molds for casting





Math 213



Trip to Shapeways
April 29, 2015

So you want to 3D print?

Design your own models

- Tinkercad / Autodesk



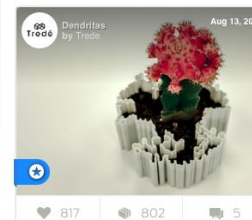
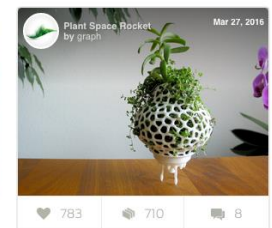
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- Thingiverse



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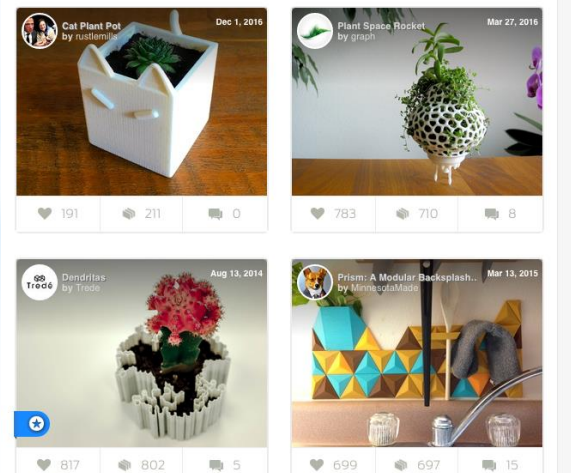
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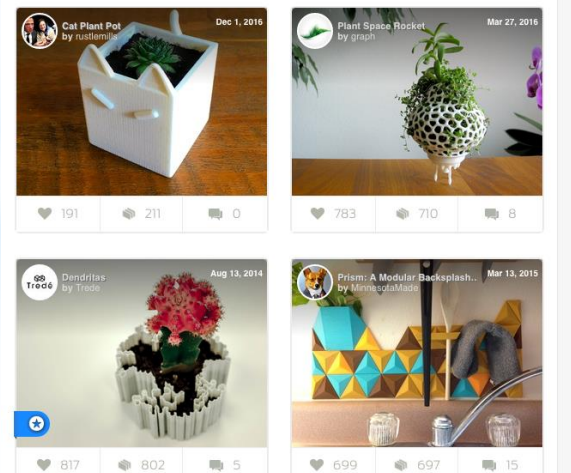
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Go do stuff

- Makerspaces
- QC Computer Graphics Club
(Prof. Greco Klapper 108)



3D Models!

