

# Cellular Solids

- Engineering cellular solids
  - Honeycombs: 2D prismatic cells
  - Foams: 3D polyhedral cells
  - Applications: sandwich panels, energy absorption, insulation
- Cellular materials in medicine
  - Trabecular bone, osteoporosis
  - Tissue engineering scaffolds; cell-scaffold mechanics
- Cellular materials in nature
  - Honeycomb-like: wood, cork
  - Foam-like: trabecular bone, plant parenchyma, sponges
  - Cellular/solid structural components in nature
    - Sandwich panels (leaves, skulls)
    - Radial density gradients (palm stems, bamboo)
    - Cylindrical shells with compliant cores (plant stems, animal quills, toucan beak)