

# NATURE'S BUILDING CODE

## CONSTRUCTION MATERIALS

EASY TO USE AND REPAIR

EFFICIENT SELF-ASSEMBLY

BASIC CELL MECHANICS - ELASTICITY, FAILURE

MICROSCOPIC MODELS:  $K_A \sim \gamma$   $\kappa_b \sim \gamma d^2$   $\lambda \sim \gamma d$   
 $\gamma d^2 / k_B T \sim 250$

## CELL DESIGNS

SPHERES AND PROLATES \*\*\*\*\*

TUBES \*\*\*

COILS \*\*

SPHERO-CYLINDERS \*\*

NO CELL WALLS FOR SMALL CELLS

DNA STORAGE CONSTRAINS CELL SIZE

## MICROFOSSILS

LIFE EMERGED RAPIDLY ON EARTH (>3.5 Ga)

COLONIES PROVIDE LAB FOR CELL MECHANICS

ADOPTION OF DESIGN

DIFFICULTY OF CONSTRUCTION

## NEARBY PLANETS

INITIAL CHEMICAL ENVIRONMENTS PROBABLY  
SIMILAR TO EARTH, BUT TEMPERATURES DIFFER

WE CAN ESTIMATE ALLOWABLE, **BUT NOT  
OPTIMAL**, CELL SHAPES AND SIZES

ROD-LIKE CELLS OF SMALL LENGTH ARE  
PROBABLY NOT VIABLE