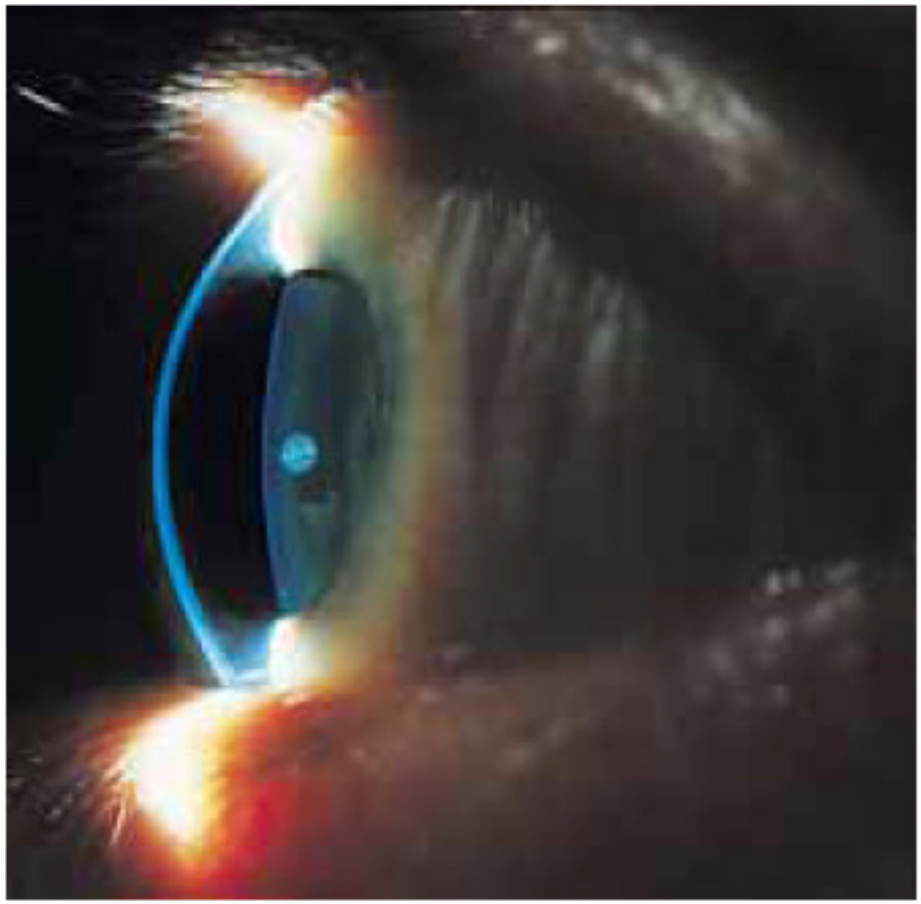
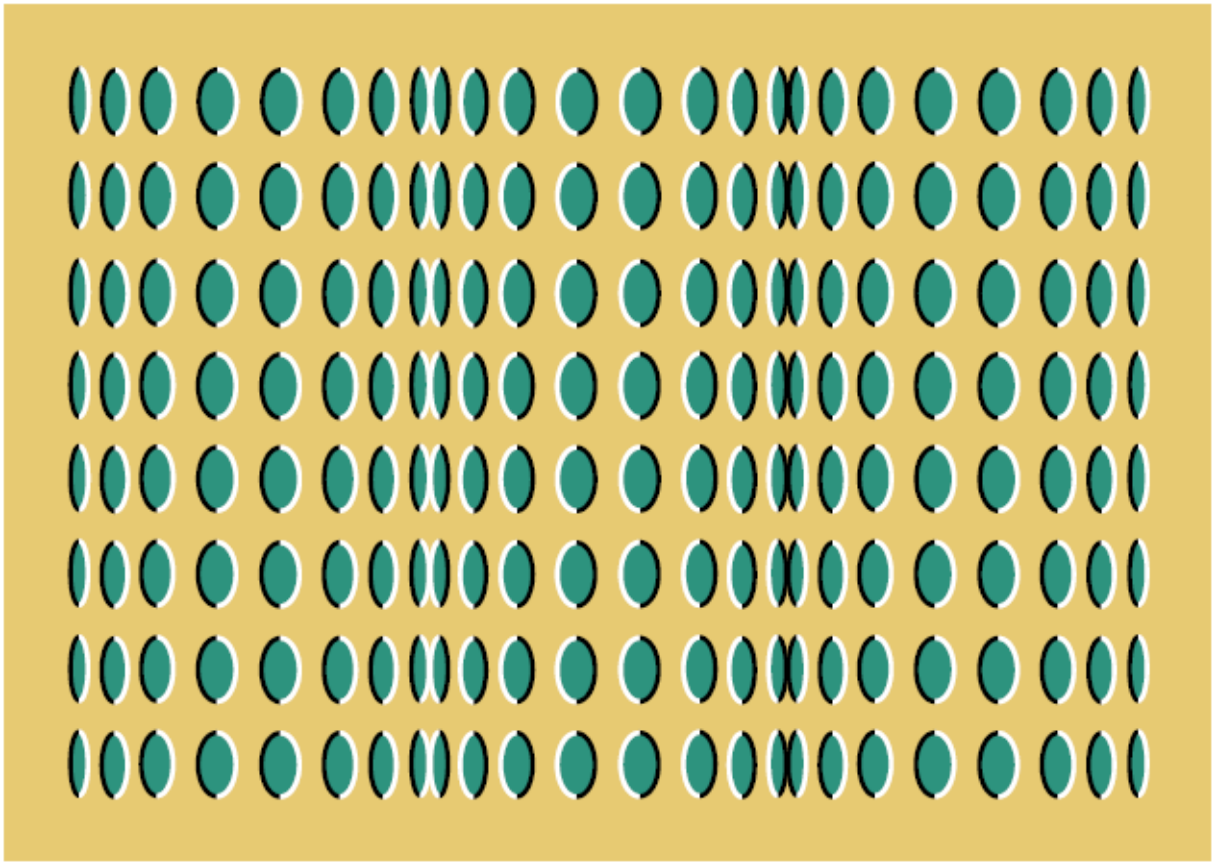
Why light is wonderful ?

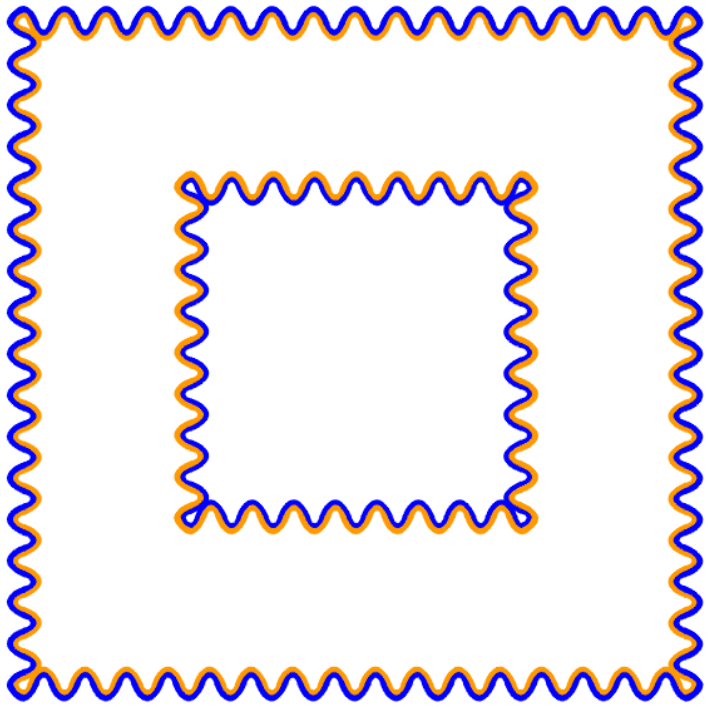


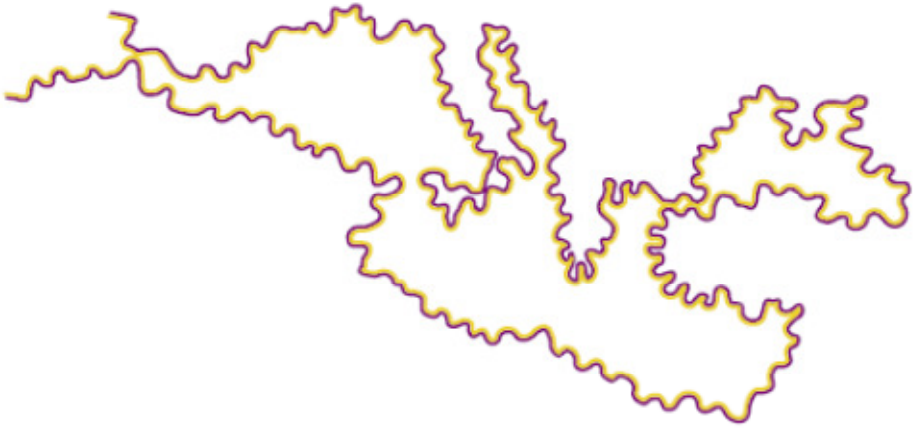
G.V. Pavan Kumar
IISER - Pune

Movement without motion



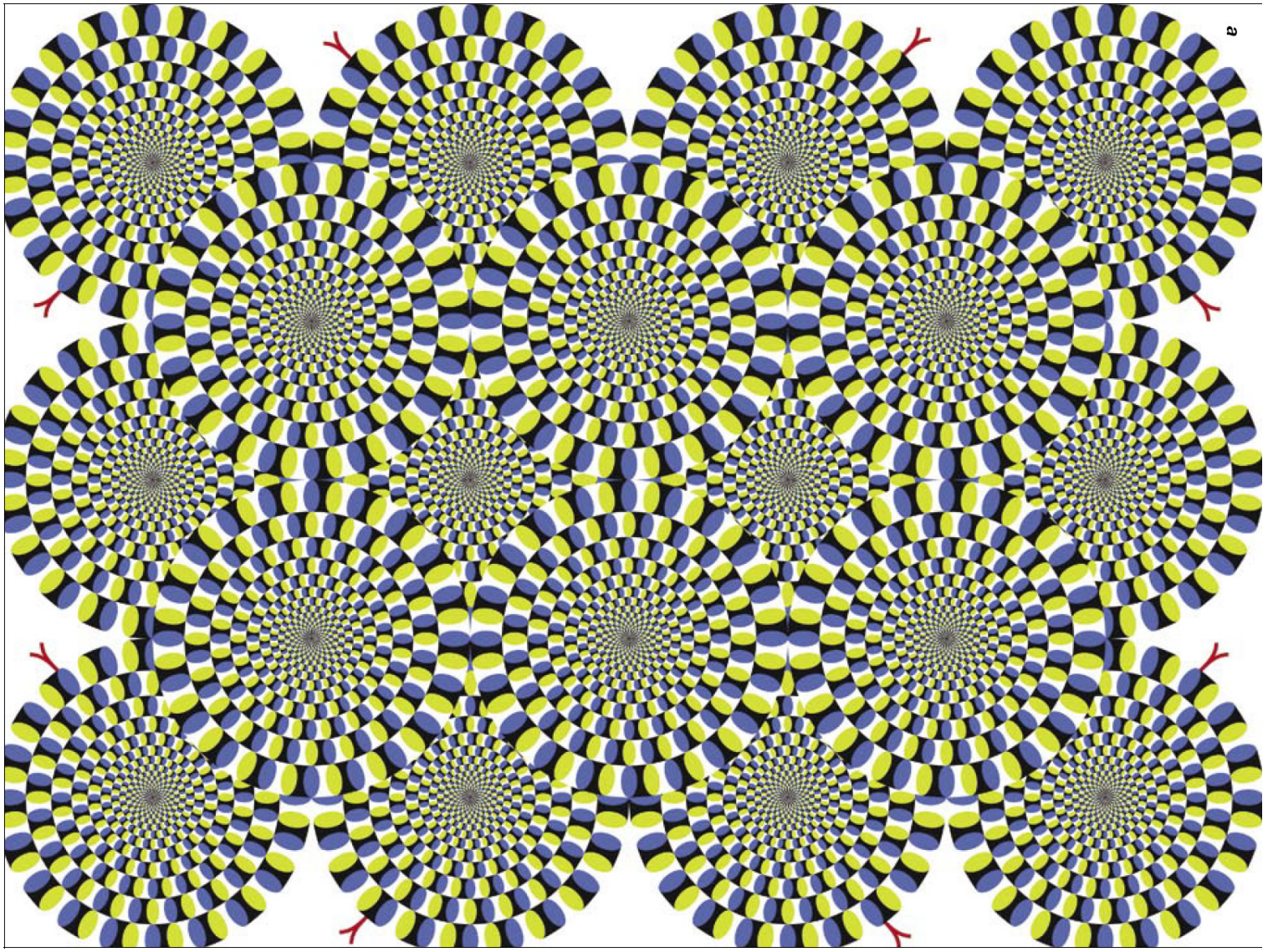
Games of eye and brain :
Watercolour effect





JOHN S. WERNER, BAINGIO PINNA and LOTHAR SPILLMANN
Scientific American, March 2007, page 90

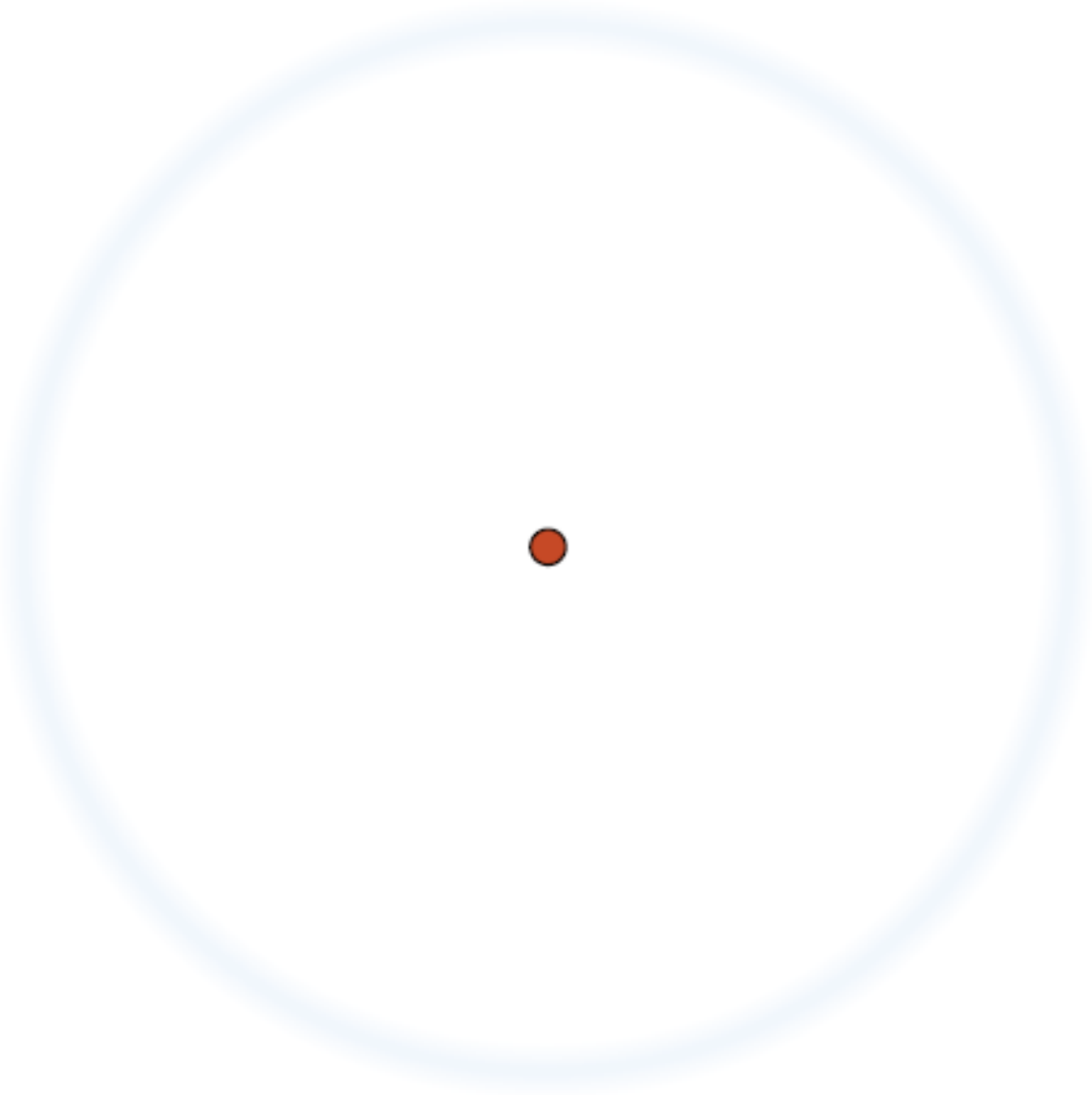
Static ????.....yet fantastic !!



VILAYANUR S. RAMACHANDRAN AND DIANE ROGERS-RAMACHANDRAN

Scientific American, March 2007, page 14

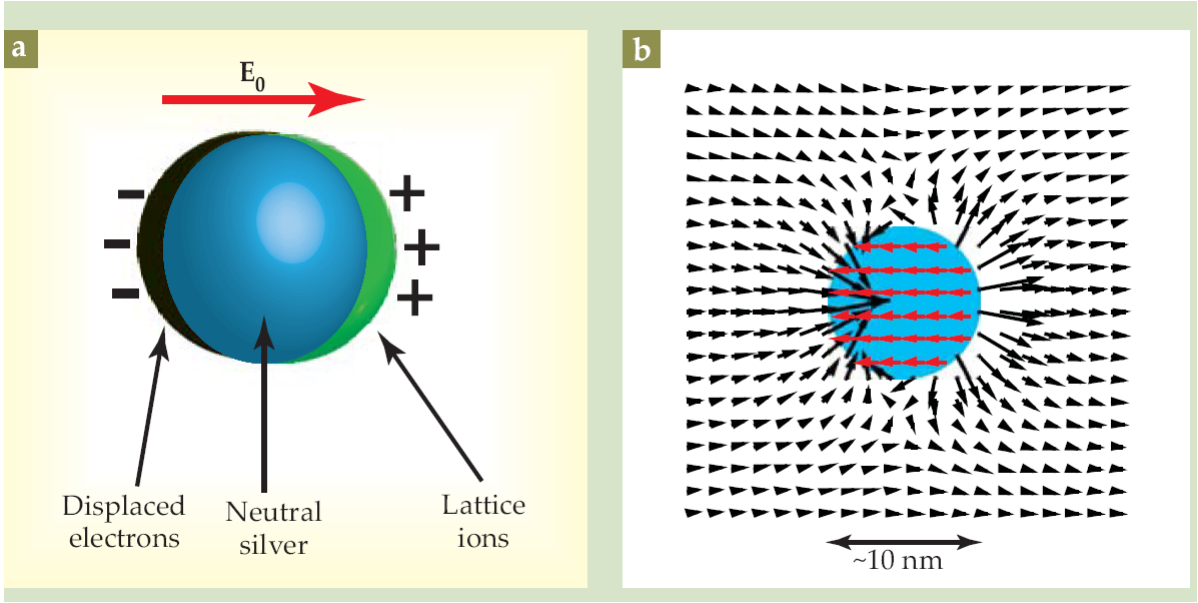
Troxler test



Ancient age

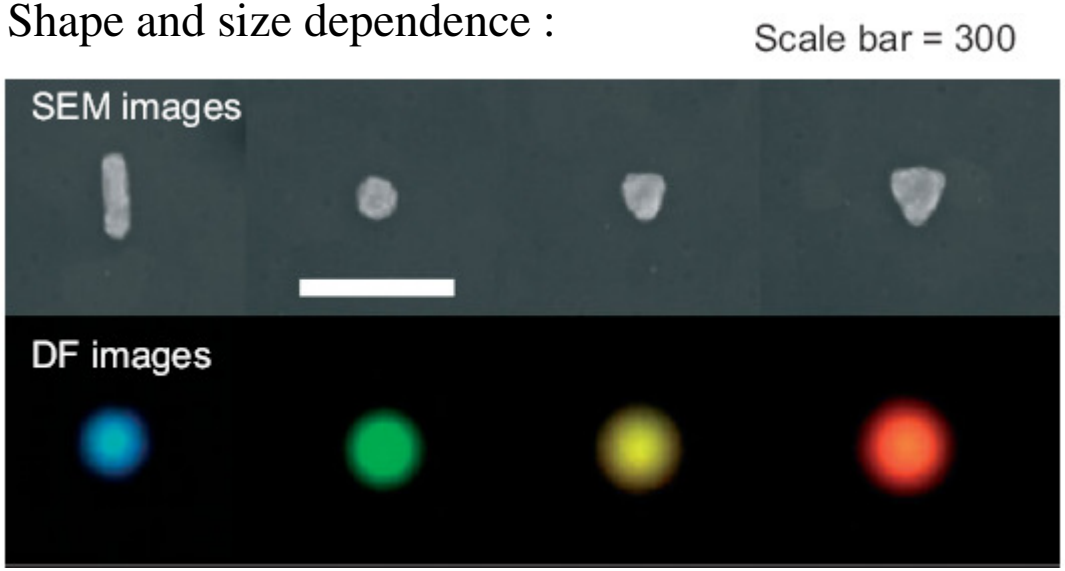
LYCURGUS CUP, a Roman goblet dating from the fourth century A.D., changes color because of the plasmonic excitation of metallic particles within the glass matrix. When a light source is placed inside the normally greenish goblet, it looks red.

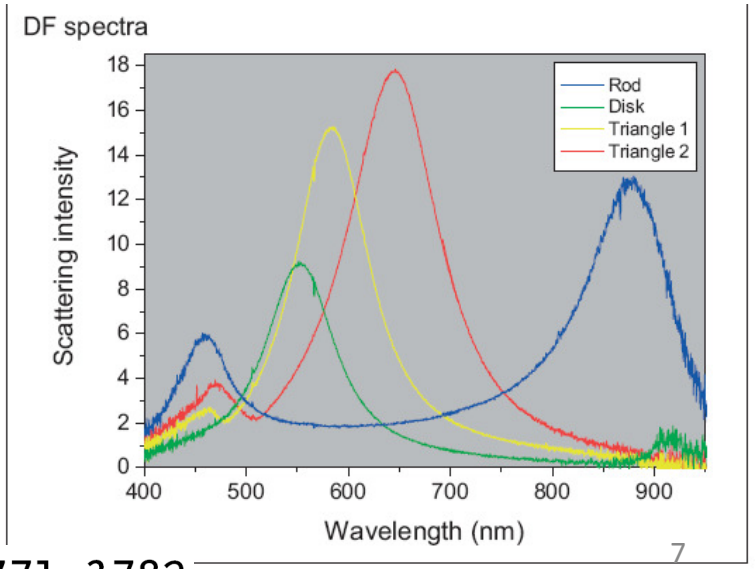
What are Plasmons ?



Stockman, **Physics Today**, page 43, Feb 2011

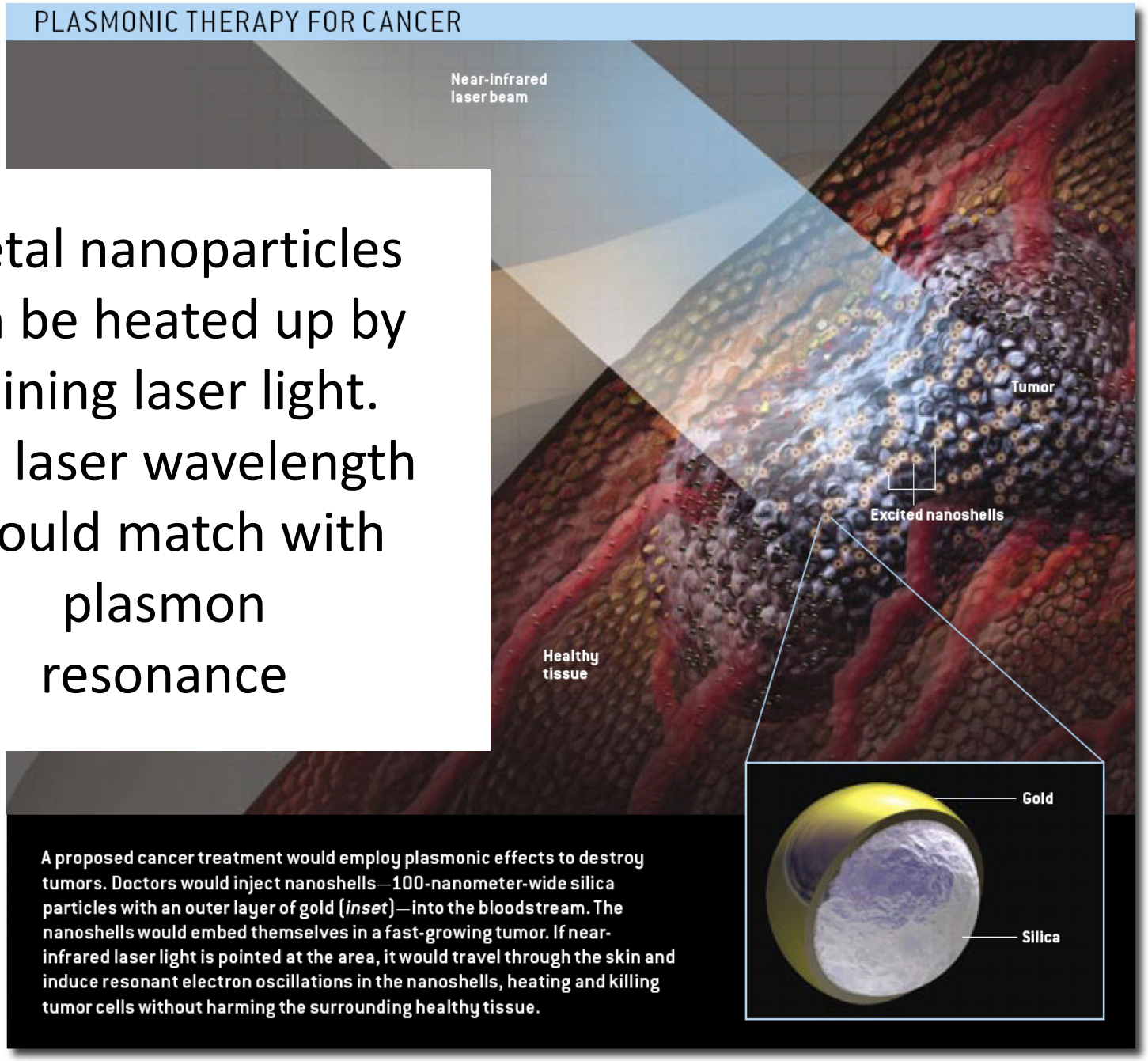
Shape and size dependence :





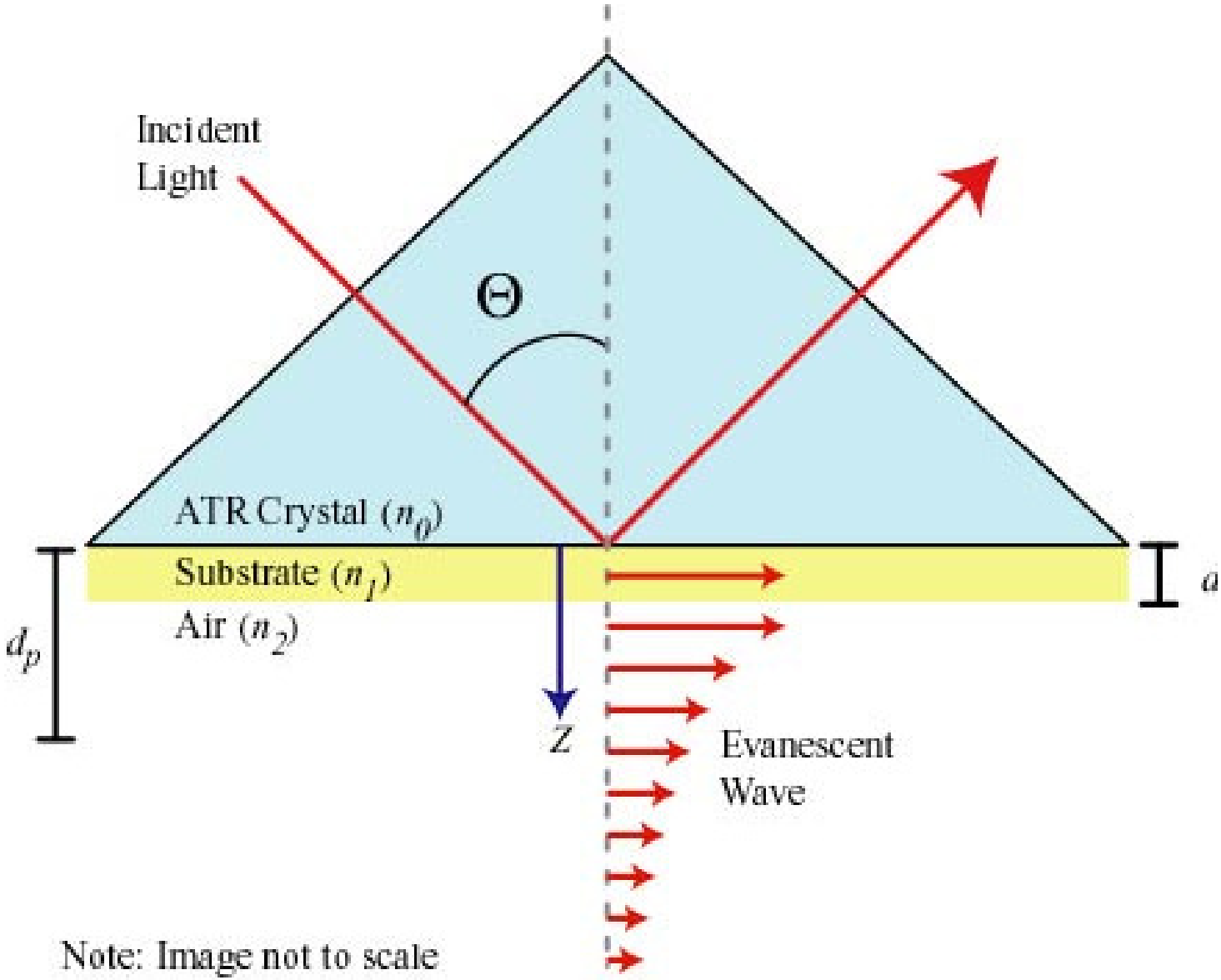
Murray and Barnes *Adv. Mater.* **2007**, *19*, 3771–3782

Metal nanoparticles can be heated up by shining laser light. The laser wavelength should match with plasmon resonance



SCIENTIFIC AMERICAN APRIL 2007

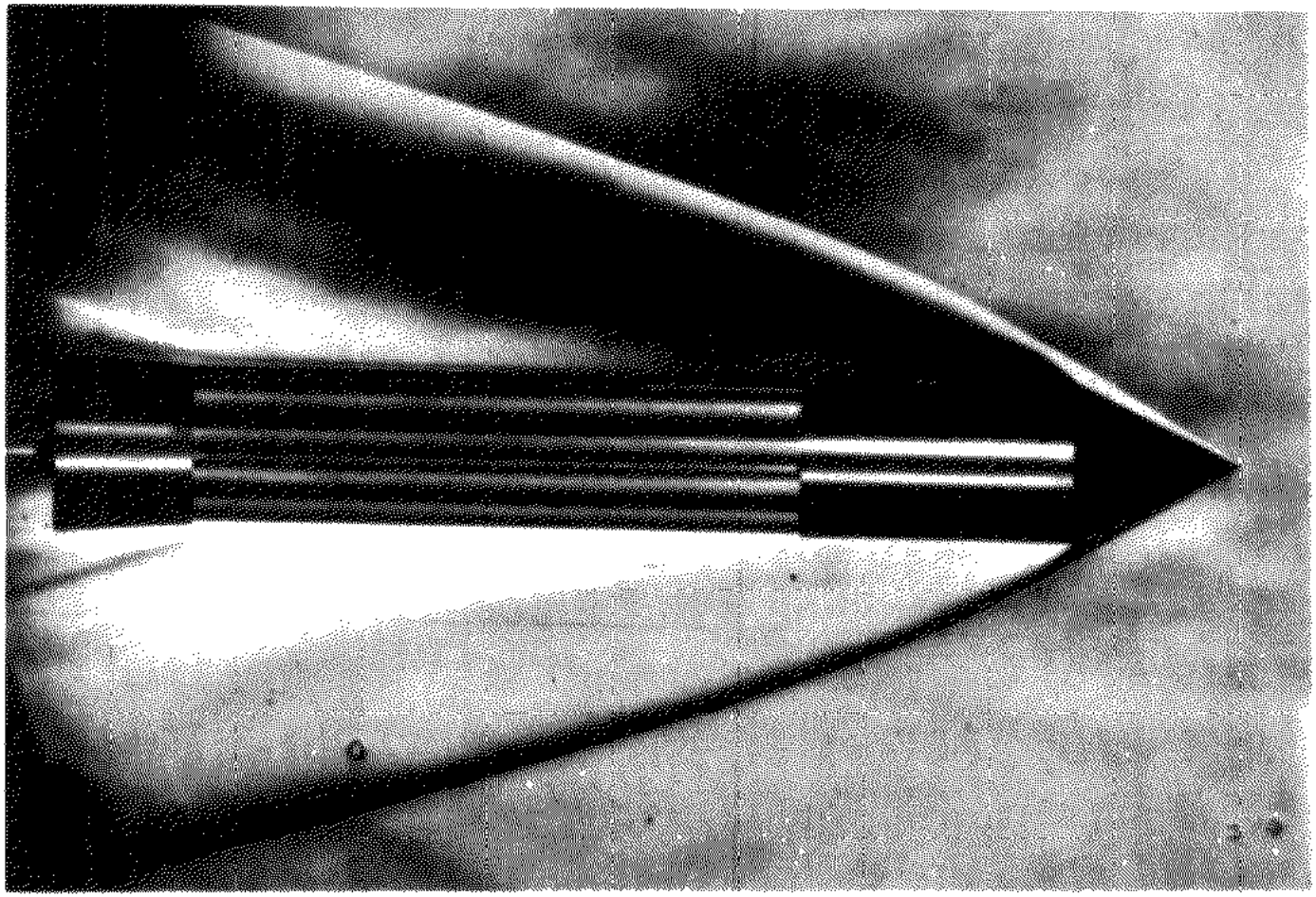
There but not there ……Evanescent waves



Bow waves

A shock wave

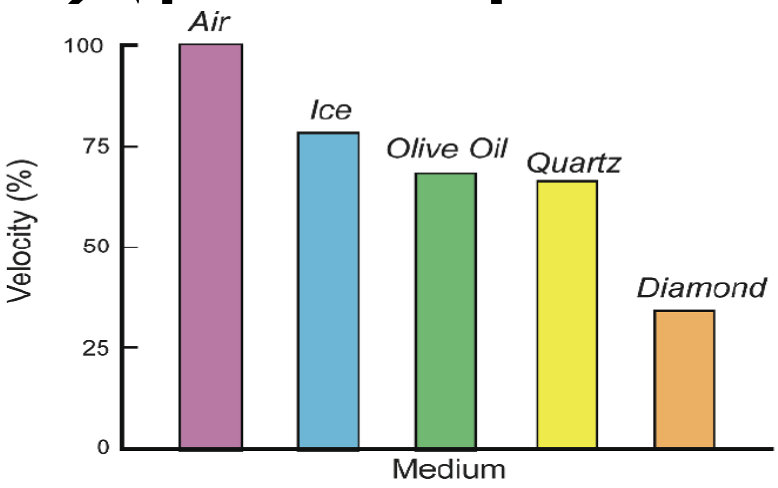
induced in a gas by a projectile moving faster than sound



Can something travel faster than light ?

Yes !!!!!! , but in a particular medium

Cl… …ffect – bow waves of light

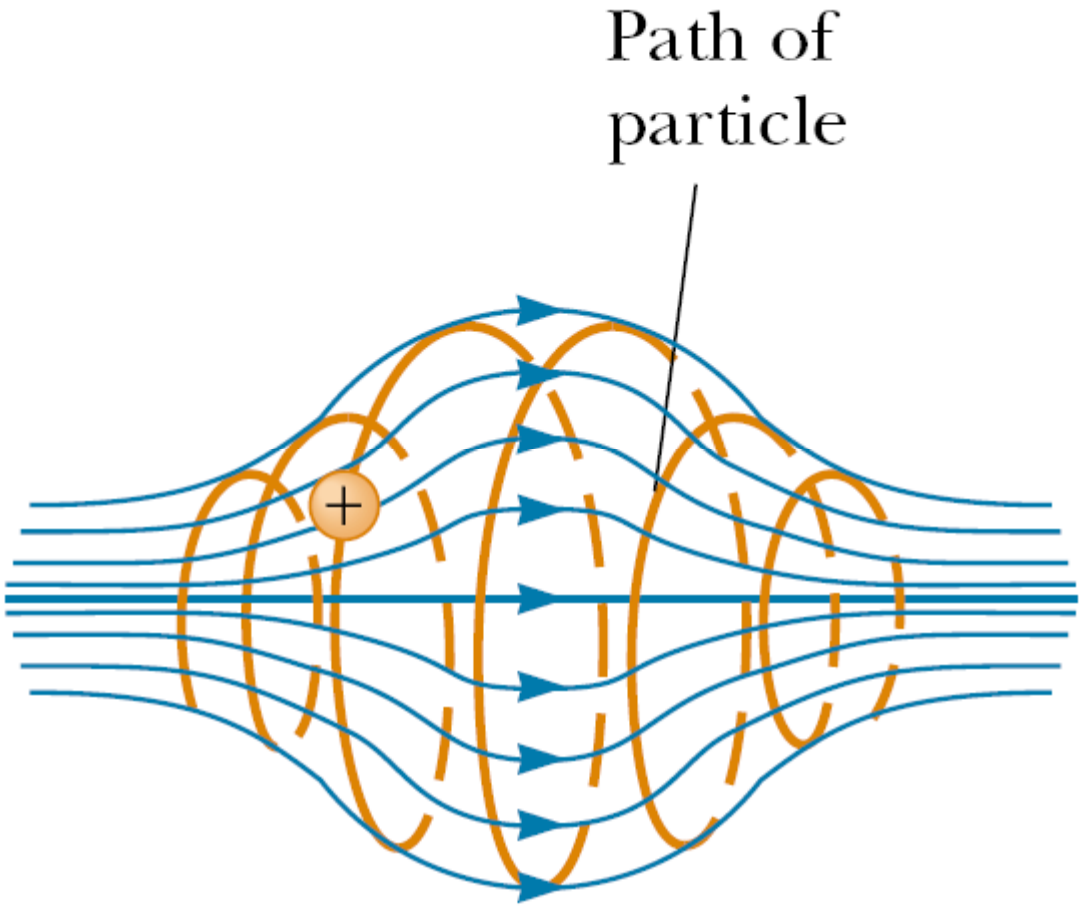


Medium	Refractive Index
Air	1.0003
Ice	1.31
Water	1.33
Olive Oil	1.47
Crown Glass	1.52
Diamond	2.42

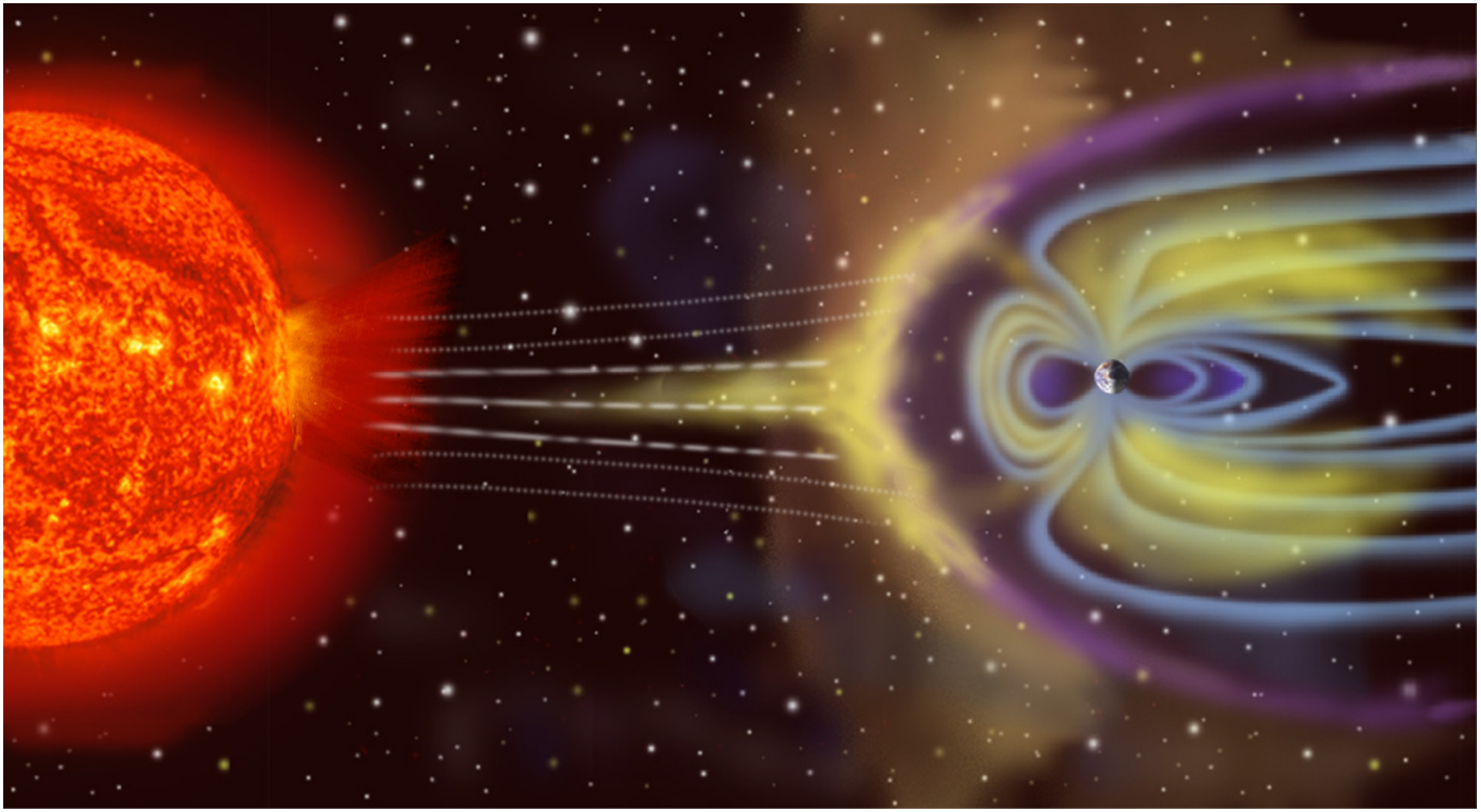
Auroras – curtains of light

Over lake Superior

Magnetic bottles



Why Auroras ?



North Dakota, USA

Auroras on Saturn
Captured by Hubble space telescope

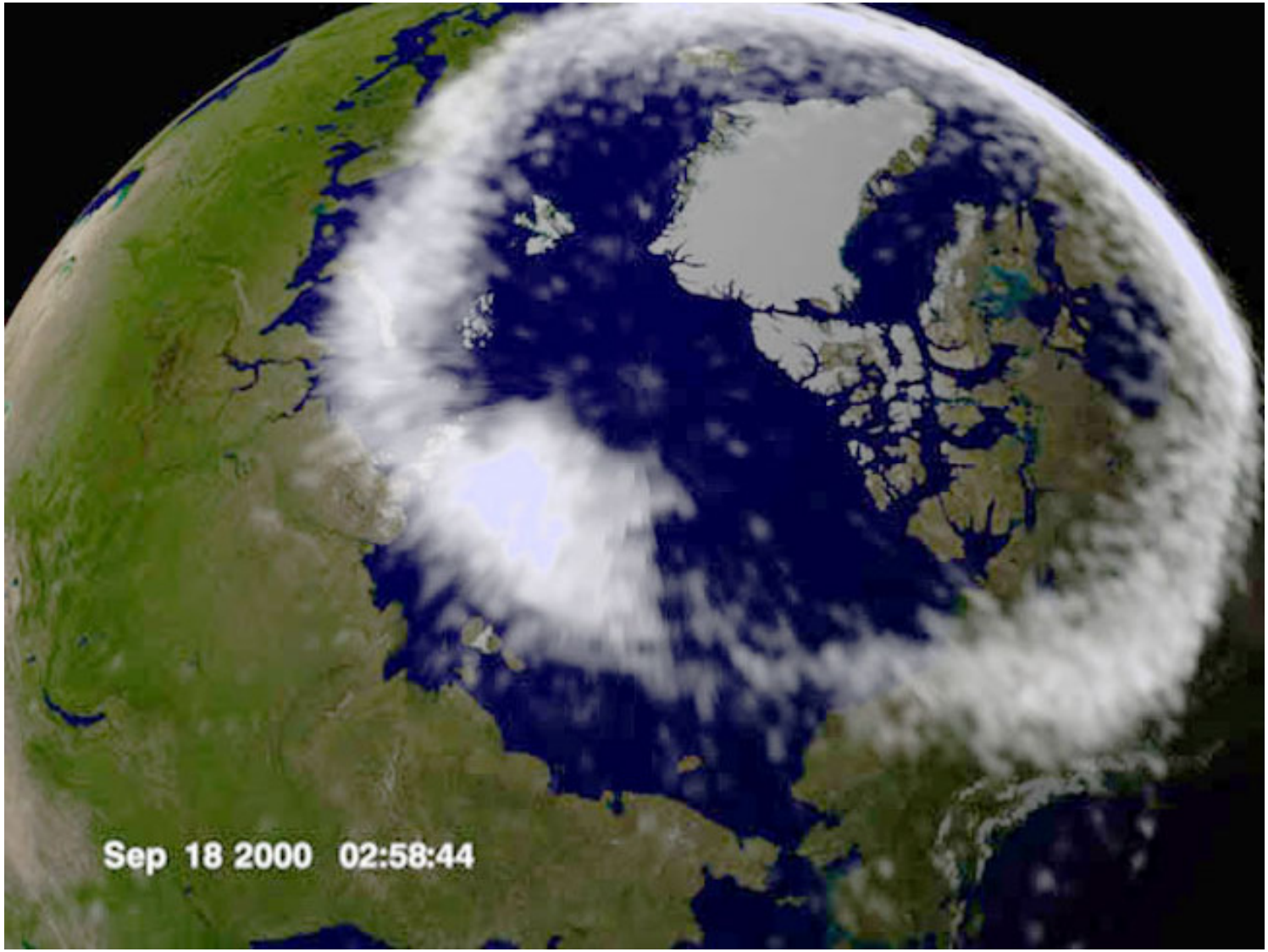
Panoramic image of Aurora & a meteor

Chena Lake in North Pole, Alaska, USA

Auroras seen from space

Volcano Hekla and an aurora in Iceland

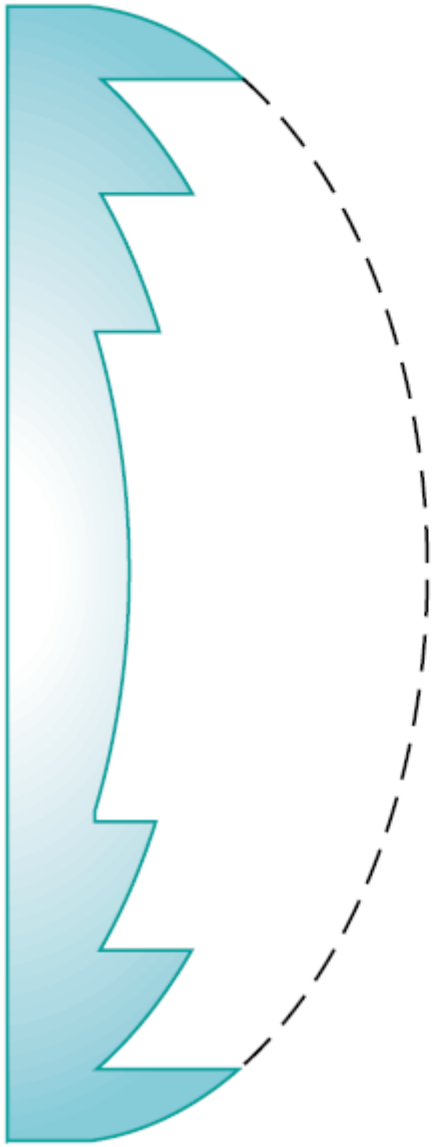
Proton Aurora – A rare phenomenon



Above Earth's magnetic north pole

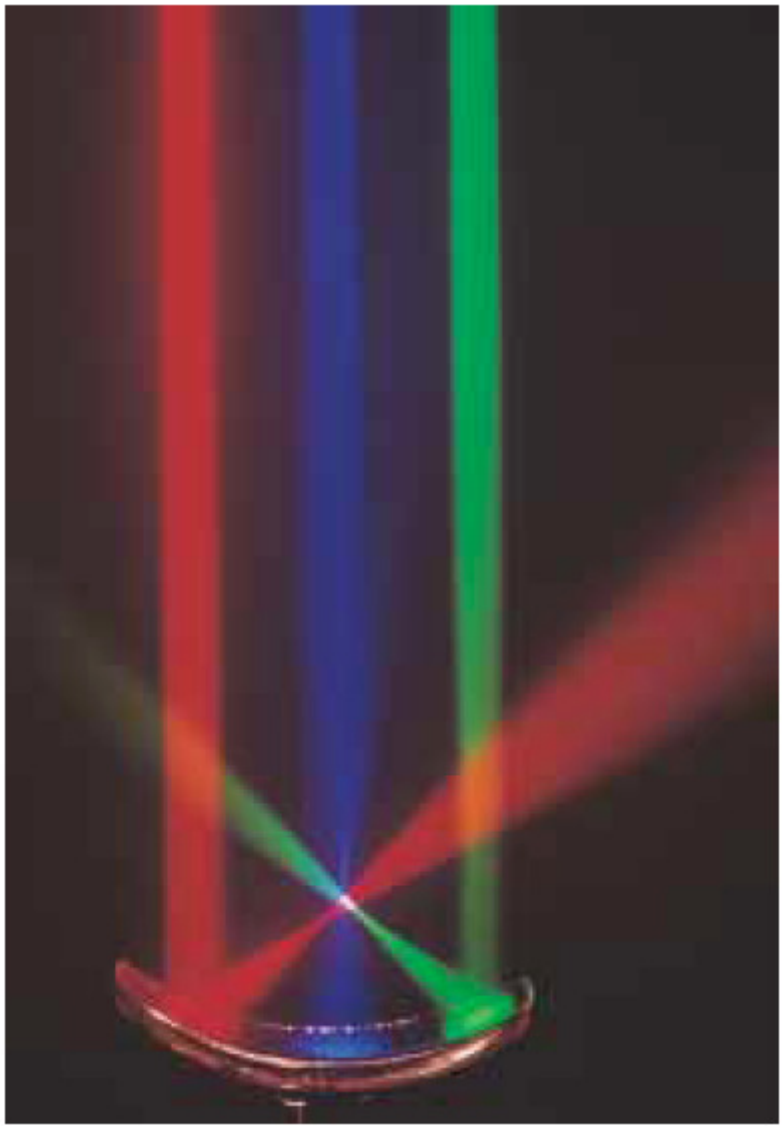
Headlights – lines on the surface ?

Fresnel lens



Normal lens

Concave mirror



Convex mirror

To find the universal elements enough;
to find the air and the water exhilarating;
to be refreshed by a morning coffee or an evening walk;
to be thrilled by the stars at night;
to be elated over a bird's nest or a wildflower in spring

.....these are some of the rewards of
simple yet special life.

Adapted from John Burroughs writing

Interesting Books

Feynman Lectures in Physics (all 3 volumes)

Vignettes in Physics by G. Venkataraman (12 books), University Press

The Flying Circus of Physics by J. Walker

E-mail address : pavanef@gmail.com

My science blog

http://science-neethi.blogspot.com/