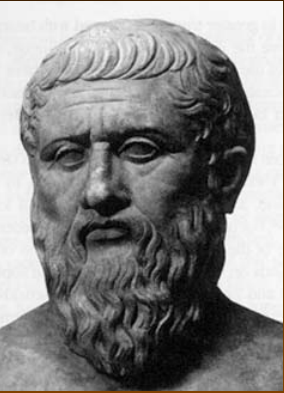
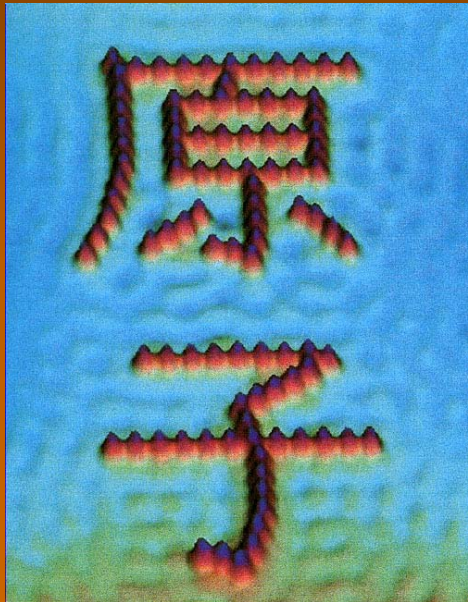


# *From* ATOMS *to the* UNIVERSE



The evolution of philosophical  
and scientific understanding of  
the physical world- *from* Plato &  
Democritus *to* Quantum physics

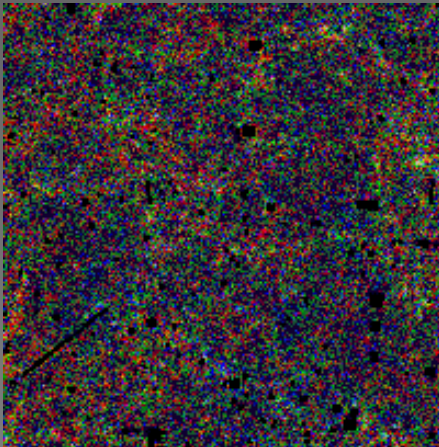
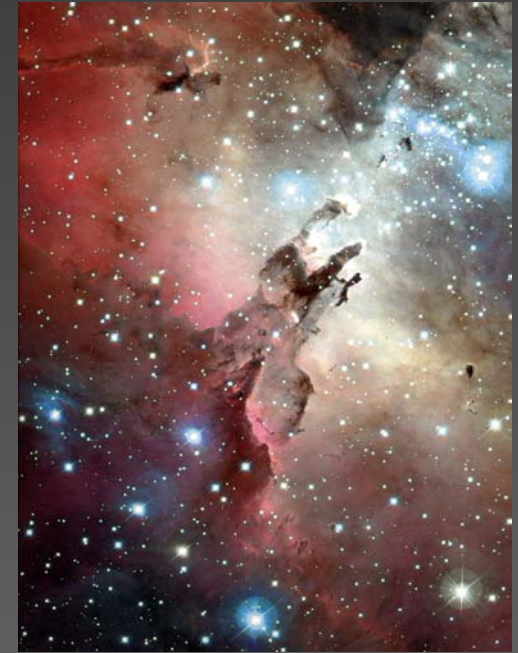


# *The* EARLY UNIVERSE

**START HERE**  
**(14 billion yrs ago)**



The universe as we know it began with the Big Bang, some 14 Gyrs ago- within 1 Gyr, structure was already appearing on very large scales, eventually resulting in the galaxies, in which stars formed- our sun some 4.7 Gyrs ago, from self-gravitating gas and dust.



# The Prehistoric World



About 480 mYrs ago (Burgess shale)

**CENOZOIC ERA:** The age dominated increasingly by mammals begins 65.3 mYrs ago. Many species come and go, including very large land mammals. Huge climatic and geographical changes ensue.

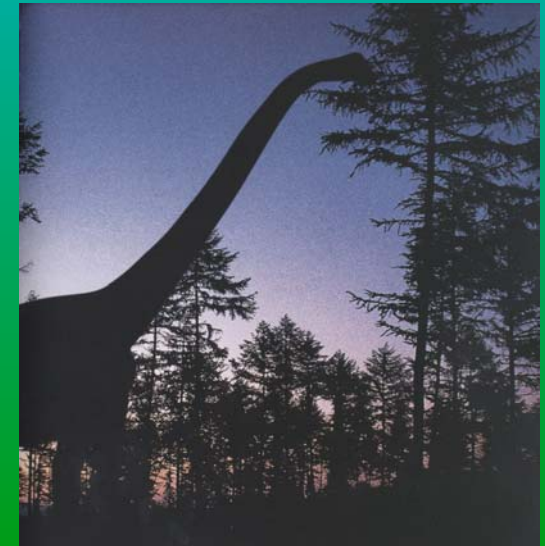
Formation of Sun, Earth: 4.7 Gyrs ago

Life began on Earth: 3 Gyrs ago

First marine animal life: 600 Myrs ago

Life on land: 300 Myrs ago

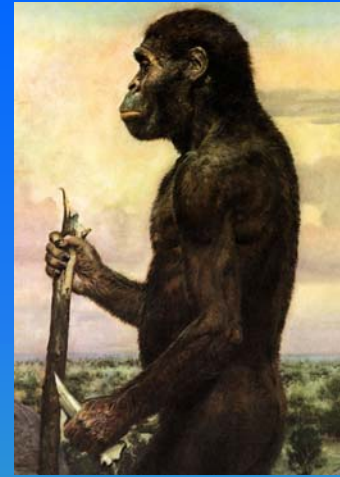
Dinosaurs: 220- 65 Myrs ago



125 Myrs ago (Jurassic)

# EARLY MAN (I)

The ancestors of modern Humans first appeared some 3 Myrs ago in the African rift valley. They slowly spread across Europe and Asia (but not the Americas or Oceania)



**Australopithecus Africanus (1 Myr)**

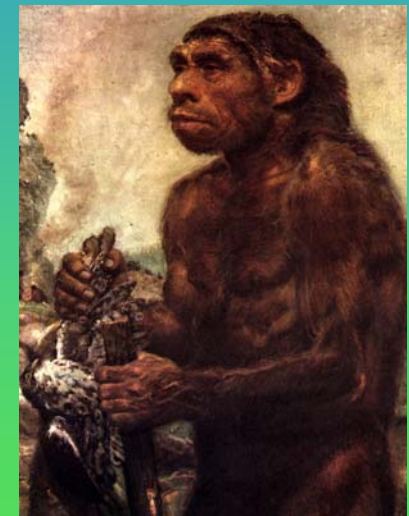


**Homo Erectus (500 Kyr)**

**Smilodon (500 Kyr)**



For much of this time life was tough for our ancestors—who were preyed upon by a variety of terrifying birds & mammals. They were omnivores, walked upright and could survive in plain & forest, and slowly evolved tools.



**Neanderthal Man (200 Kyr)**



## EARLY MAN (II)

The last 50 Kyr have been dominated by ice ages and climate fluctuations. In the midst of this turmoil, modern man (*Homo sapiens*) appeared. Some 23 Kyr ago the competition between *Homo Sapiens* & *Homo Neanderthalis* was settled in Europe (although interbreeding took place).



Many of the species most important to Prehistoric man have disappeared in the last 20 Kyr.

**Old Stone Age  
(c. 30,000 yrs ago)**

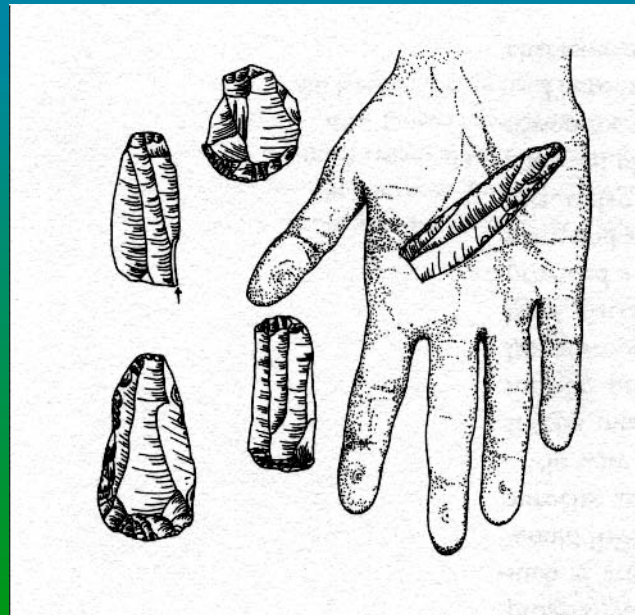
## EARLY MAN (III)



**Caves at Lascaux:  
(c. 16 Kyr)**

**The stone age tools  
were made from flint  
or bone, and shaped  
by chipping.**

**In the midst of the ice  
Prehistoric man was  
developing tools, and  
recording in sculpture  
and paintings what life  
he was leading.**



**Veronica stone  
carved sculpture  
(c. 25 Kyr)**