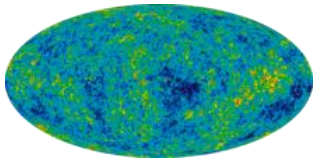
梅 経 霜 雪 香 愈 烈 人 到 無 求 品 自 高

梅は
霜雪
（そうせつ）を
経（へ）ば
香り
愈（いよいよ）
烈（はげ）し
人は
求む無きに
到れば
品（ひん）
おのずから
高し

“Hardships to the Stars.”
The more noble, the more humble.
The more ignorant, the more arrogant."
苦難に打ち勝って栄光の星へ
実るほど　頭を垂れる　稲穂かな

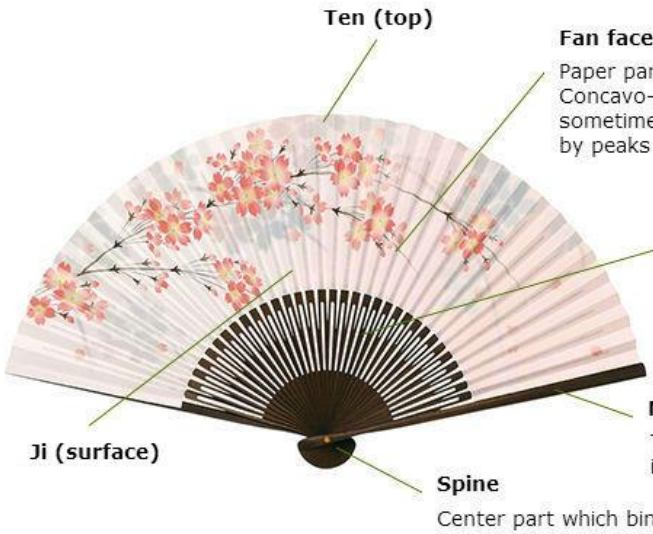


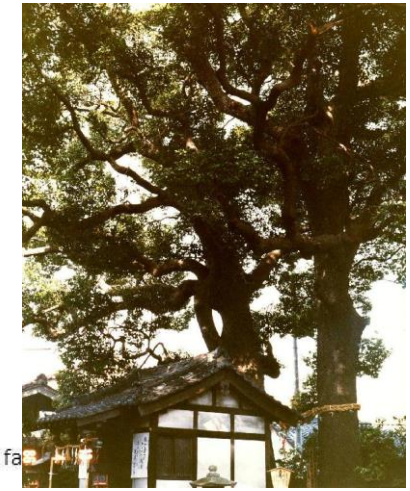
Before snow and frost melt, colorful flowers are in bloom, and the scent of plum blossoms remains even after they fall" 13.79billion years - Crystal – Chrysalis – Chrysanthemum - Christ

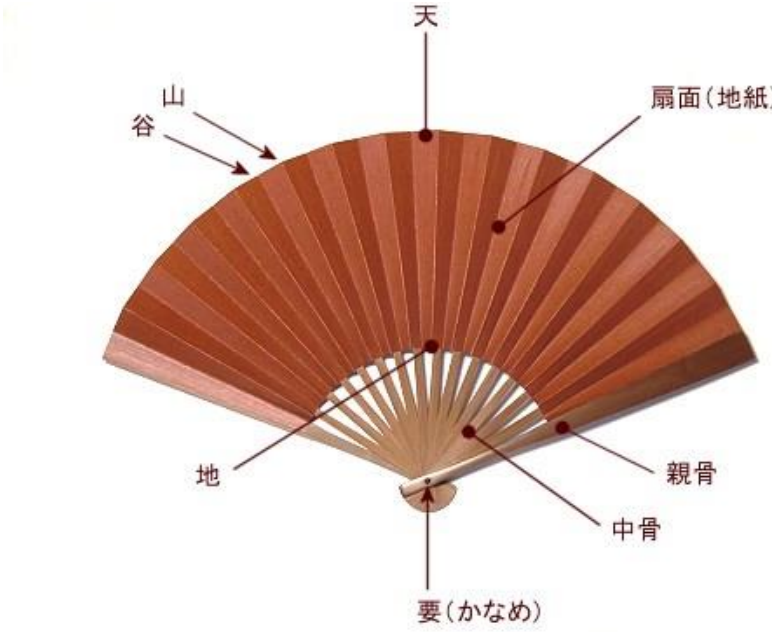
The age of the universe is 13.799±0.021 billion years.　宇宙の年齢 138 億年

the trees of life and knowledge　「生命と知識の樹」

「That boughs that bear most hang lowest.
（最も多く実をつけている枝が最も低くたれている）」


Ten (top)
Fan face (base paper)
Paper part of fan.
Concavo-convex parts are
sometimes differentiated
by peaks and troughs
Inner ribs
Slim and thin
bamboo parts
Main/outer ribs
Thick and hard bones of fa
in both ends
Ji (surface)
Spine
Center part which binds and holds all ribs




天
山
谷
扇面（地紙）
地
親骨
中骨
要（かなめ）

Physical cosmology **Big Bang · Universe**

Age of the universe

Chronology of the universe

In physical cosmology, the age of the universe is the time elapsed since the Big Bang. The current measurement of the age of the universe is 13.799±0.021 billion years ((13.799±0.021)×109 years) within the Lambda-CDM concordance model. The uncertainty of 21 million years has been obtained by the agreement of a number of scientific research projects, such as microwave background radiation measurements by the Planck satellite, the Wilkinson Microwave Anisotropy Probe and other probes. Measurements of the cosmic background radiation give the cooling time of the universe since the Big Bang, and measurements of the expansion rate of the universe can be used to calculate its approximate age by extrapolating backwards in time.

The chronology of the universe describes the history and future of the universe according to Big Bang cosmology, the prevailing scientific model of how the universe developed over time from the Planck epoch, using the cosmological time parameter of co-moving coordinates. The metric expansion of space is estimated to have begun 13.8 billion years ago. The time since the Big Bang is also known as cosmic time. For the purposes of this summary, it is convenient to divide the chronology of the universe into four parts:

The very early universe, from the Planck epoch until the cosmic inflation, or the first picosecond of cosmic time; this period is the domain of active theoretical research, currently beyond the grasp of experiments in particle physics.

The early universe, from the Quark epoch to the Photon epoch, or the first 380,000 years of cosmic time, when the familiar forces and elementary particles have emerged but the universe remains in the state of a plasma, followed by the "Dark Ages", from 380,000 years to about 150 million years during which the universe was transparent but no large-scale structures had yet formed.

Diagram of evolution of the (observable part) of the universe from the Big Bang (left) - to the present.

從大爆炸形成的宇宙演化圖解。在這幅圖中宇宙以二維呈現，第三維度是時間，向右是時間流動的方向。

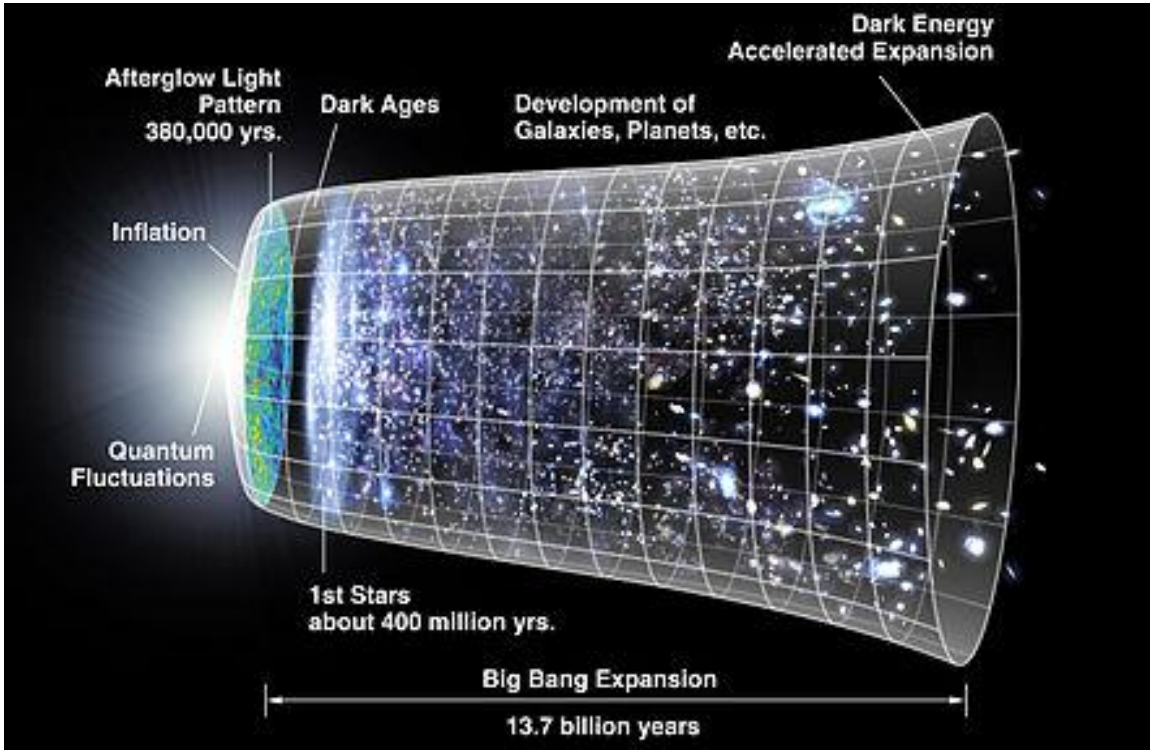
宇宙年代學，或宇宙年表依據大爆炸宇宙論描述宇宙的歷史和未來，目前的宇宙如何由普朗克時期隨著時間演化的科學模式，使用宇宙的共動坐標系時間參數。宇宙膨脹的模型即是所知的大爆炸，在 2015 年，估計開始於 137.99 ±0.21 億年前。為了方便, 將宇宙的演化分成三個階段。

在第一階段，最早的宇宙是炙熱、充滿活力，那裏即使有粒子存在或可能存在，也只是短暫的。根據目前的科學理論，我們現在周圍看見的各種不同的力，在這個時候是結合在一起的統一力。在暴脹時期的無限能量過程中涉及時空本身膨脹。巨大的能量逐漸降溫 －與我們現在在周圍各處看到的溫度相比是不可思議的熱，但力仍能夠經由對稱性破缺一個一個的分離出來，從一種力再釋放出另一種力，原本凝聚的力反復的分離，最終從電弱力分離出強力和第一個顆粒。

宇宙的歷史 - 重力波是假設來自大一統理論，超光速就在大爆炸之後（2014 年 3 月 17 日）。

在第二階段, 宇宙進一步冷卻生成夸克-膠子電漿，當前我們知道的基本力經由更多的對稱性破缺逐漸生成，尤其是電弱對稱性破缺 －和我們今天看到我們周圍複雜複合分子的完整範圍變得可能，導致重力主導的宇宙、第一批的中性原子（～80%是氫）和今天我們檢測到的宇宙微波背景輻射。現代的高能粒子物理理論已經能滿足這些能量的水準，所以物理學家相信對這一部分和後續再我們周圍發展的宇宙，基本上已經有很好的理解。由於這些變化，在這個階段結束時，空間對光和電磁能量來說不再是模糊不清，而是已經透明了。

The period of large-scale structure formation, including stellar evolution, galaxy formation and evolution and the formation of galaxy clusters and superclusters, from about 150 million years to present, and prospectively until about 100 billion years of cosmic time; The thin disk of our galaxy began to form at about 5 billion years. The solar system formed at about 4.6 billion years ago, with the earliest traces of life on Earth emerging by about 3.5 billion years ago.



The far future, after cessation of stellar formation, with various scenarios for the ultimate fate of the universe.

在短暫的黑暗之後，第三階段開始，宇宙大尺度的穩定結構出現。目前我們所知的基本粒子和力，如最早的恆星、類星體、星系、星系團和超星系團發展出來，創造出我們今天看到的宇宙。一些研究著聲稱所有的這些物理結構發展要超過數十億年的時間，並稱之為「宇宙演變」。其它的，多個交叉的學門，研究人員是從大爆炸到人類出現作為整個場景，使"宇宙演變"更趨複雜。到目前為止，納入生物學和文化，用更統一與跨領域的觀點看待宇宙，是至今最複雜的系統[5]。

對於未來，科學家預測大約在 10 億年後地球將不再能支援生命，50 億年後將籠罩在極度膨脹的太陽之下。在更長的時間尺度，當恆星最終步入死亡而少有新的恆星誕生來取代它們。布滿恆星時期將結束，並通往一個黑暗的宇宙。各種理論建議了一些後續的可能性：如果粒子，像是質子不是穩定的，最終可能蒸發進入更低的能量狀態，像是一種熱死亡的熵。或者宇宙可能崩潰成為大擠壓，然而目前的資料顯示宇宙擴張的速度還在繼續增加。如果這是正確的，宇宙最終可能隨著物質和能量的日漸稀薄，可能會以"大冰凍"結束。替代的建議還包括虛真空激變和大撕裂使宇宙結束。