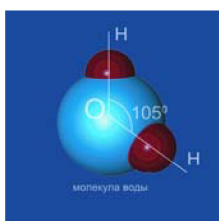


# MYSTERIES OF WATER AND LIFE

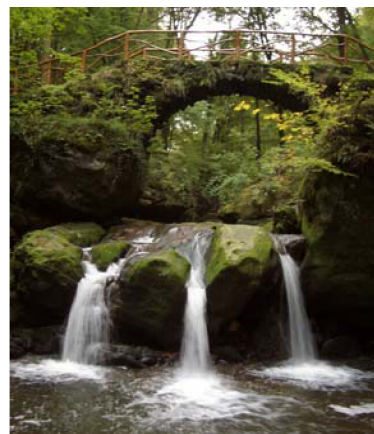
*Water is the driving force of all nature.*  
**Leonardo da Vinci**

**W**ater is one of the most unique and mysterious substances on Earth. Its nature is still beyond the reach of contemporary science. At first glance, water is simple, and in fact it was long considered to be a pure element. It was not until the XVIII century that scientists proved that water is not a simple element but a compound of hydrogen and oxygen. Following that discovery, hydrogen was given its name (*hydro genes* translates from Greek as “water-creating”).



Further research showed that a seemingly plain formula  $\text{H}_2\text{O}$  describes a substance of unique structure and properties. The secrets of water have defied scientists for more than two centuries. Even today scholars are aware that water's properties are elusive and abnormal, they are not bound by the laws of physics which govern all other things in the Universe. Here are just a few of the properties of this life-giving substance:

- Water's thermal capacity is 3,100 times greater than that of air and 4 times greater than that of rock. Water regulates heat exchange in the human body and allows people to stay comfortable and save energy. With its extraordinary ability to store heat, water helps the human body, which is two-thirds water, to maintain its normal temperature in scorching heat and biting frost.
- Water is hard to freeze, and ice is slow to melt. Thanks to this, the Earth's climate is stable and mild, and man can live and prosper in a friendly environment.
- The freezing of water is accompanied by an abrupt decrease in density by more than 8 per cent, while most other substances get denser when they crystallize. For this reason ice occupies more space than liquid water and does not sink. This change in density is unique to water and is crucial for all life on Earth. Ice that forms on the surface of bodies of water serves as a floating blanket which saves rivers and lakes from freezing completely and underwater life from dying. If ice were heavier than water, it would sink to the bottom, and all living creatures in rivers, lakes, seas, and oceans would freeze and die. The whole Earth would eventually turn into a frozen wasteland.



## Earth's water resources:

Seas and oceans	1.4 bn km <sup>3</sup>
Glaciers	30m km <sup>3</sup>
Rivers and lakes	2m km <sup>3</sup>
Atmosphere	14,000 km <sup>3</sup>
Living organisms	65%

Water's unique properties and its role in the survival of all life on Earth have been a constant challenge to scientists. The study of water has revealed new facts about the world around us. These new ideas help us to better understand the properties of water and the peculiarities of its interaction with other substances.