

# ESCAMPIG HERALD

## LIQUEFACTION OF HELIUM ANNIVERSARY

On 10th July 1908, around 7 p.m., Heike Kamerlingh Onnes in Leiden, the Netherlands, succeeded in helium liquefaction. Today is the 116th anniversary of his historical achievement.

He utilized a five-stage cooling cascade: He used chloromethane (boiling point 249 K) to liquefy ethene (b.p. 170 K), ethene to liquefy oxygen (b.p. 90 K), and oxygen to liquefy air (b.p. around 79 K).

He used liquid air to precool hydrogen before its liquefaction (b.p. 20 K) and hydrogen to precool helium (a scarce gas back then), further cooled by the Joule-Thomson expansion.



**Heike Kamerlingh Onnes**  
www.espacotempo.com.br

After 13 hours of cooling, the measured temperature of helium reached a constant value. It refused to decrease further as if the thermometer was in a liquid. At that moment, Onnes illuminated the vessel with helium and saw the surface of liquid helium "standing out sharply defined like the edge of a knife."

The work was so intensive that day that Onnes had no time to eat. His wife had to feed him. The long-term preparation of the experiment was so exhausting that after the successful liquefaction of helium, Onnes fell ill for several months.

Onnes later studied the behavior of matter at such low temperatures. He discovered superconductivity and opened the door to the discovery of superfluidity and a further journey into an even much cooler world.

As luck would have it, yesterday was also the 130 anniversary of Pyotr Kapitsa's birthday in 1894. He was a famous soviet physicist researching the world of extra-low temperatures.



## WANTED



## HAUNTED

### BY THE FOLLOWING QUESTIONS?

- What are the latest trends in plasma simulation research?
- What are the challenges in multi-physics plasma models?
- How does high-performance computing enhance plasma simulations?
- What uncertainties impact plasma model accuracy?
- How are plasma simulations applied in the industry?

**WORKSHOP  
PREDICTIVE AND  
PRACTICAL  
SIMULATIONS OF  
PLASMA SYSTEMS  
AND PLASMA  
PROCESSES**

17:00 - 19:00

Find the answers you seek and put your restless mind at ease in the panel discussion with world-leading experts.

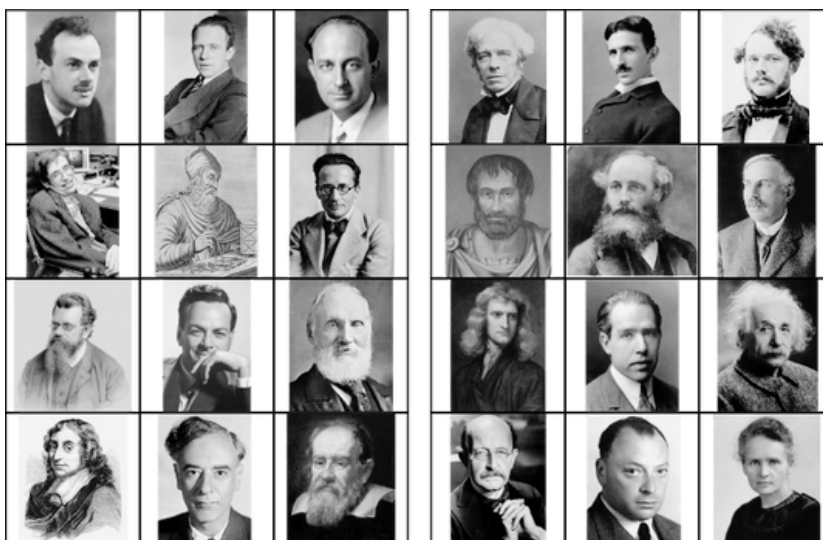
Featuring: Anna Nelson, Vasco Guerra, Markus Becker, and Mark Kushner, chaired by Adam Obrusník.

## TODAY'S CIPHER

Today enigma draws on the wisdom of several generations of renowned physicists. It was prepared by Petr Bílek.

**To solve it, you need to pick up a full version of the cipher, containing three printed sheets, from the reception.**

Can you crack the cipher and reveal the English password?



Werner von Siemens	Enrico Fermi	Erwin Schrödinger	Wolfgang Pauli	Ernest Rutherford	Isaac Newton
Ludwig Boltzmann	Archimedes	Stephen Hawking	Lev Landau	Michael Faraday	Niels Bohr
Galileo Galilei	Marie Curie	Albert Einstein	Werner Heisenberg	Lord Kelvin	Richard Feynmann
Paul Dirac	James C. Maxwell	Blaise Pascal	Nikola Tesla	Aristotle	Max Planck
I have never met a man so ignorant that I could not learn something from him.	Before I came here, I was confused about this subject. Having listened to your lecture, I am still confused -- but on a higher level.	I do not think you can name many great inventions that have been made by married men.	Most important part of doing physics is the knowledge of approximation.	Thoroughly conscious ignorance is the prelude to every real advance in science.	Nothing is more practical than a good theory.
A physical law must possess mathematical beauty.	If I have seen further it is by standing on the shoulders of Giants.	One never notices what has been done; one can only see what remains to be done.	Give me a place where I can stand -- and I shall move the world.	Truth is so obscure in these times, and falsehood so established, that, unless we love the truth, we cannot know it.	An alleged scientific discovery has no merit unless it can be explained to a barmaid.
The roots of education are bitter, but the fruit is sweet.	Stop telling God what to do with his dice.	Not only is the Universe stranger than we think, it is stranger than we can think.	If a man never contradicts himself, the reason must be that he virtually never says anything at all.	Physics is like sex: sure, it may give some practical results, but that's not why we do it.	Ideas alone have little value. An innovation's importance lies in its practical implementation.
Can you measure it? Can you express it in figures? Can you make a model of it? If not, your theory is apt to be based more upon imagination than upon knowledge.	God made the bulk; the surface was invented by the devil.	A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it.	God does not play dice with the universe.	A man who is certain he is right is almost sure to be wrong.	Not only does God play dice but... he sometimes throws them where they cannot be seen.