

The coming of age of plasma physics

December 19 2018

Once upon a time, people thought that electrons and ions always stuck together, living happily ever after. However, under low density of matter or high temperatures, the components of matter are no longer bound together. Instead, they form plasma, a state of matter naturally occurring in our universe, which has since been harnessed for everyday applications such as TV screens, chip etching and torches, but also propulsion and even sustained energy production via controlled fusion.

In a fascinating editorial for a special plasma issue of *EPJ H*, called "Plasma physics in the 20th century as told by players", three physicists share their perspectives on key events in the early history of plasma physics, in the first half of the 20th century. First, Patrick Diamond, from the University of California San Diego, USA, shares his recollections of the early days of wireless transmission and the description of the 'Heavyside Layer' (the electrically conducting layer of the upper atmosphere, which transmits radio waves). In turn, Yves Pomeau from the Ecole Polytechnique in Palaiseau, France, talks about the role of Irving Langmuir in the development of plasma [physics](#) theory, namely his calculation of the frequency of oscillation of electrons in a plasma environment with much heavier ions. Lastly, Uriel Frisch from the University Cote D'Azur in Nice, France, describes the birth of nuclear [fusion](#) theory.

For those interested in reading further about [plasma](#), this EPJ H special issue covers both the fundamentals and the applications related to magnetic-confinement-based controlled fusion between 1950 and 2000. The story ranges from the Soviet era and Russian efforts to the

standpoints of French, Japanese, Chinese and American physicists involved in building tokamaks around the world—and more recently ITER- to experiment with controlled fusion, which is governed by [plasma physics](#).

More information: Patrick H. Diamond et al, Editorial introduction to the special issue "Plasma physics in the 20th century as told by players", *The European Physical Journal H* (2018). [DOI: 10.1140/epjh/e2018-90061-5](#)

Provided by Springer

Citation: The coming of age of plasma physics (2018, December 19) retrieved 26 April 2024 from <https://phys.org/news/2018-12-age-plasma-physics.html>

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