



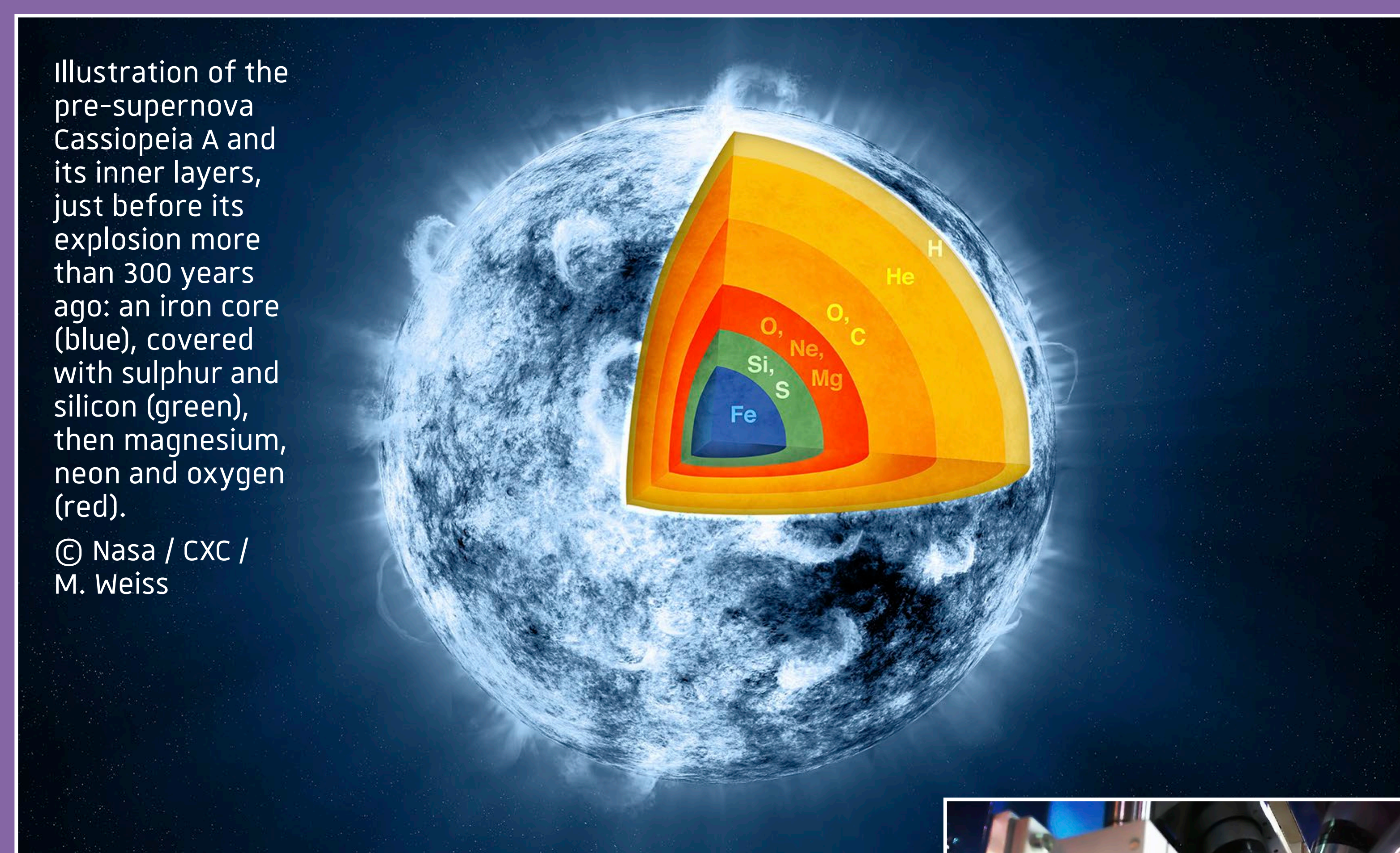
Sandrine Courtin

USIAS Marguerite Perey Chair (2023-2025)



Sandrine Courtin is professor of nuclear physics at the University of Strasbourg (France), based at the Hubert Curien Pluridisciplinary Institute (IPHC), a joint research unit of the university and of the French National Centre for Scientific Research (CNRS). In autumn 2023, she was awarded the Marguerite Perey Chair in the natural sciences at the University of Strasbourg Institute for Advanced Study (USIAS), a position which was created in 2022 to recognize Strasbourg-based researchers who have made an exceptional contribution to their field.

In her research, she aims to reproduce in the laboratory nuclear reactions that occur inside stars, which can have an impact on the late stages of massive stars such as supernovae events. This is key to understanding the origin of the elements, in particular carbon and oxygen, which are essential to the origin of life.



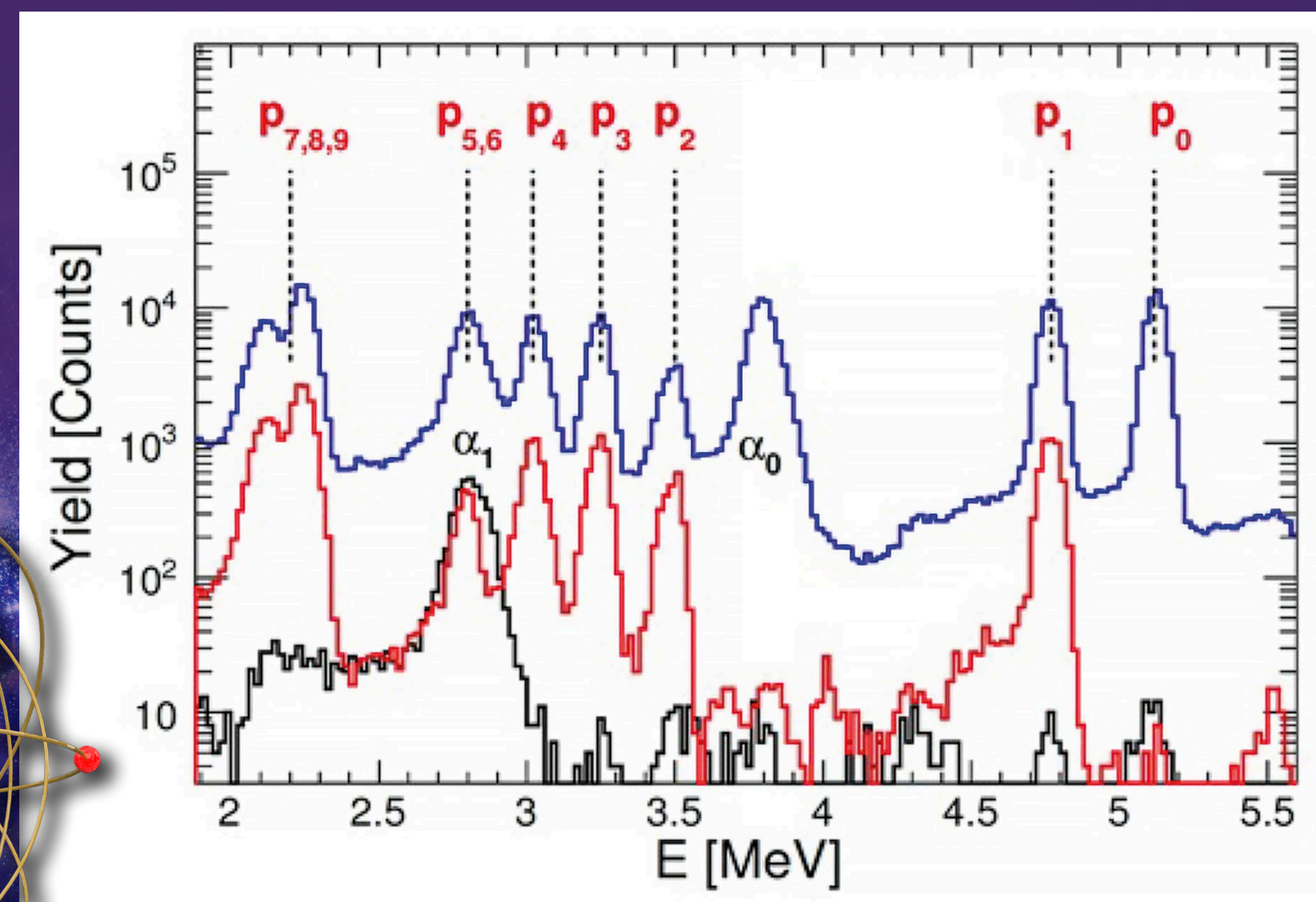
The carbon-carbon reaction is the gateway that opens the path to producing all elements that follow in the periodic table. Predicting the probability that they occur within the framework of quantum theory can lead to equations that are extremely difficult to solve as they may rely on a framework of hypotheses, such as the occurrence of clusters in nuclei, which is still much debated. Together with collaborators, Sandrine Courtin chose another option: to reproduce in the laboratory the conditions that occur in stars, and to measure directly the probability of a particular reaction taking place, which is a huge experimental challenge.

"Every time I obtain a result, it's like a window that opens onto nature and reveals a glimpse of future questions. The moment when we at last manage to characterise a phenomenon in the world that surrounds us is priceless. I have the same sense of amazement every time."

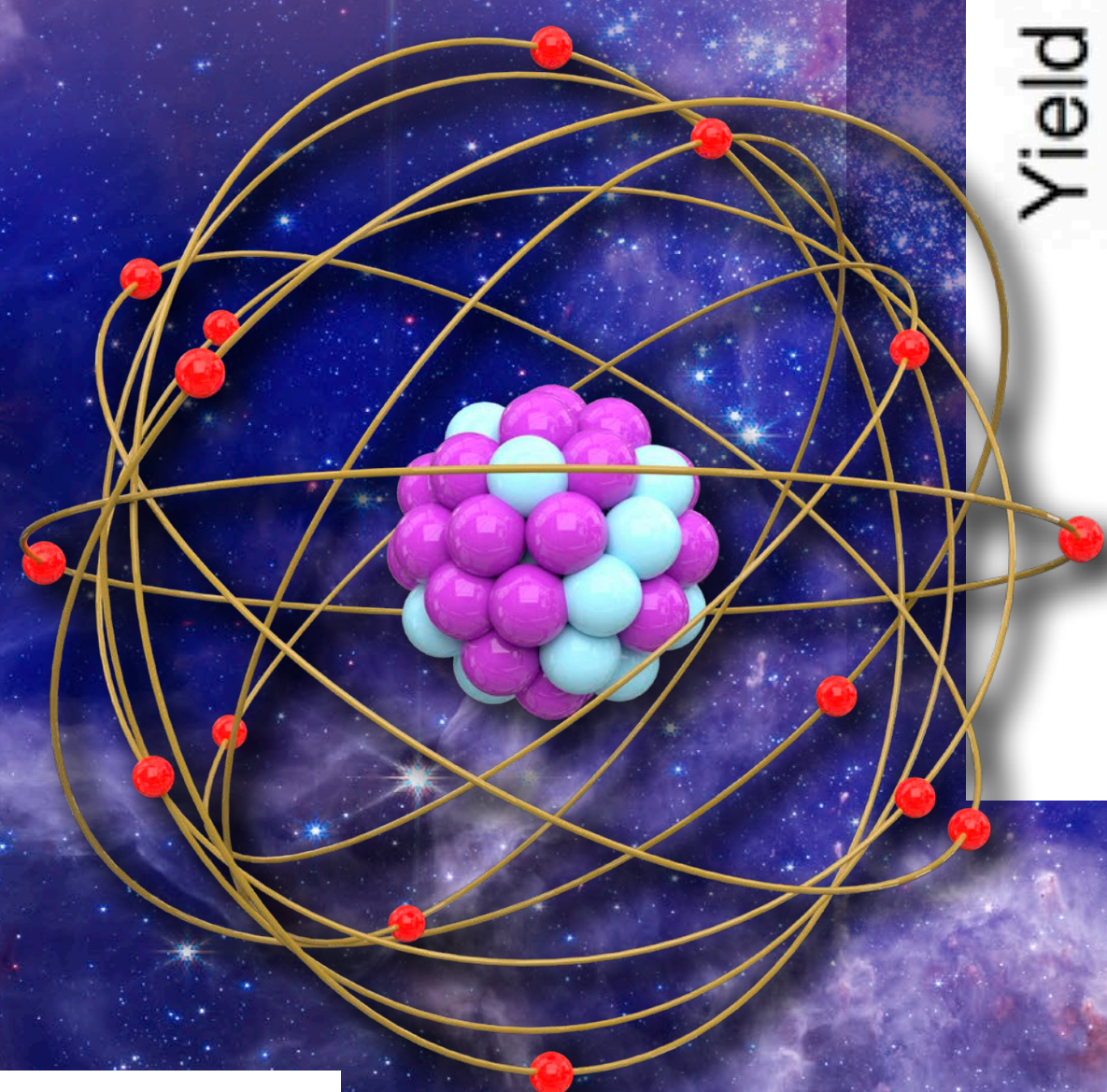


Professor Courtin and her team were instrumental in the conception of a dedicated experimental station that measures fusion cross sections in light systems with an unprecedented accuracy using a particle-gamma coincidence technique, the STELLA (STELLAR LABORatory) based at the Andromède accelerator (IJCLab, Orsay, France). In 2021 she became director of the IPHC in Strasbourg, which brings together more than 400 people working in physics, chemistry, environmental sciences and biology. Her aim is to facilitate cutting-edge research in these fields and to encourage the emergence of new cross-disciplinary projects.

"The next big step will be to reach a unified understanding of the evolution of the stars and nuclear reactions within them. And this will lead to pluridisciplinary studies between astrophysics and nuclear physics that will drive their players, who use different languages, to find common ground and to communicate better."



The Marguerite Perey Chair in the natural sciences is named in honour of Marguerite Perey (1909-1975), a French physicist who is recognised for her discovery of the element francium. In her early career, she was mentored by Marie Curie and subsequently studied at the Sorbonne in Paris. She was made head of department of nuclear chemistry at the University of Strasbourg in 1949 and was the first woman to be elected at the French Academy of Sciences in 1962.



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