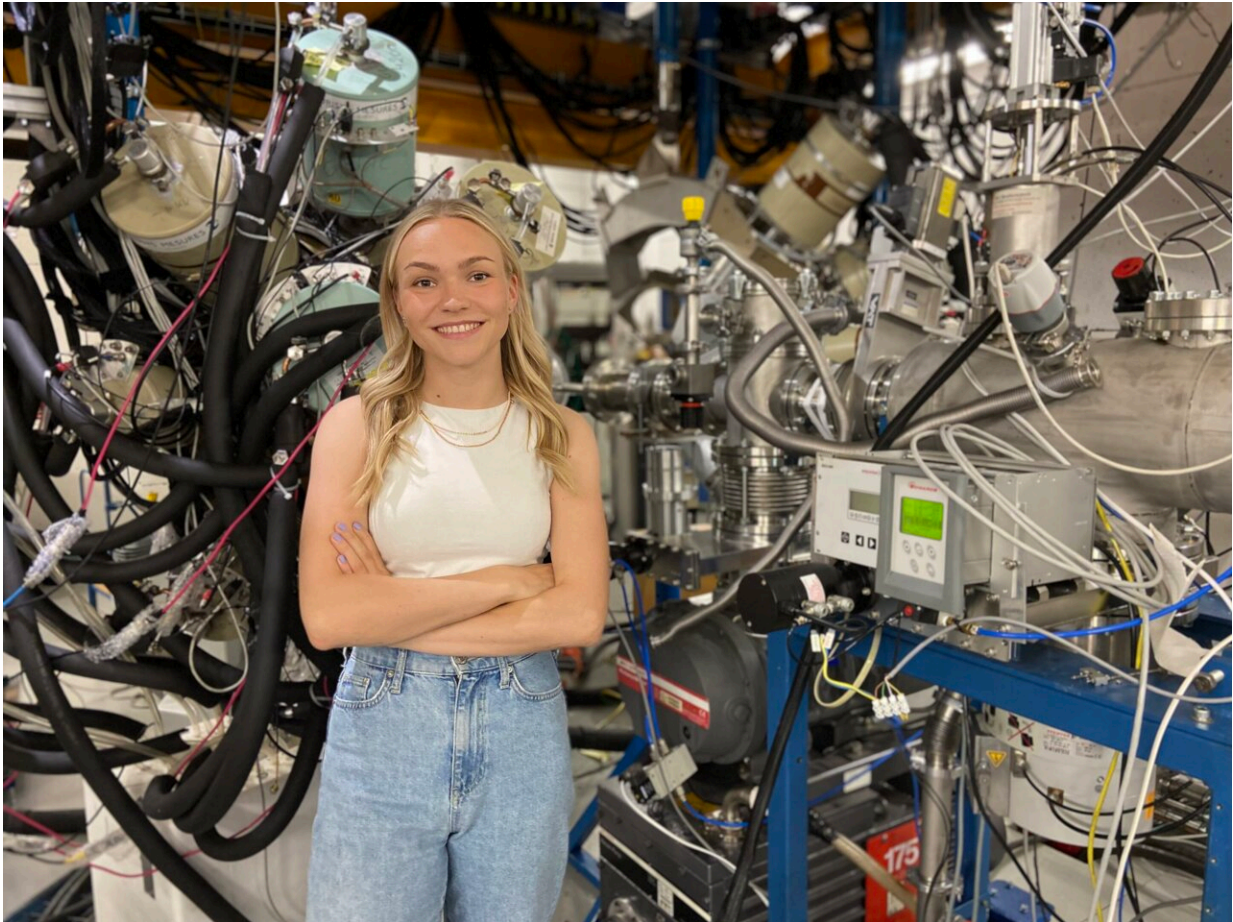


# Researcher discovers new isotope of astatine

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Henna Kokkonen. Credit: University of Jyväskylä

An experiment performed in the Accelerator Laboratory of University of Jyväskylä, Finland, has succeeded in producing a previously unknown atomic nucleus,  $^{190}\text{At}$ , consisting of 85 protons and 105 neutrons.

The nucleus is the lightest isotope of astatine discovered to date.

Astatine is a fast-decaying, and therefore rare element. It has been estimated that in the Earth's crust there is no more than one tablespoon of astatine.  $^{190}\text{At}$ , the new isotope, was produced in the fusion of  $^{84}\text{Sr}$  beam particles and silver target atoms. The isotope was detected among the products by using the detectors of a RITU recoil separator.

## New nucleus emits alpha particles

The new nuclei decay via alpha decay towards more [stable isotopes](#). Alpha decay is a common decay mode of heavy nuclei.

"The studies of new nuclei are important for understanding the structure of atomic [nuclei](#) and the limits of known matter," says Doctoral Researcher Henna Kokkonen from the Department of Physics, University of Jyväskylä.

The new discovery was made by Kokkonen, who recently graduated with a Master of Science degree. The study was a part of her master's thesis, and the research is published in the journal *Physical Review C*.

"In my thesis, I analyzed [experimental data](#) among which the new isotope was found. During my thesis process and summer internships I got to know the Nuclear Spectroscopy group's work. Now I am very happy to work in the group towards my Ph.D. degree," says Kokkonen.

**More information:** H. Kokkonen et al, Properties of the new  $\alpha$ -decaying isotope  $\text{At}^{190}$ , *Physical Review C* (2023). [DOI: 10.1103/PhysRevC.107.064312](https://doi.org/10.1103/PhysRevC.107.064312)

Provided by University of Jyväskylä

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