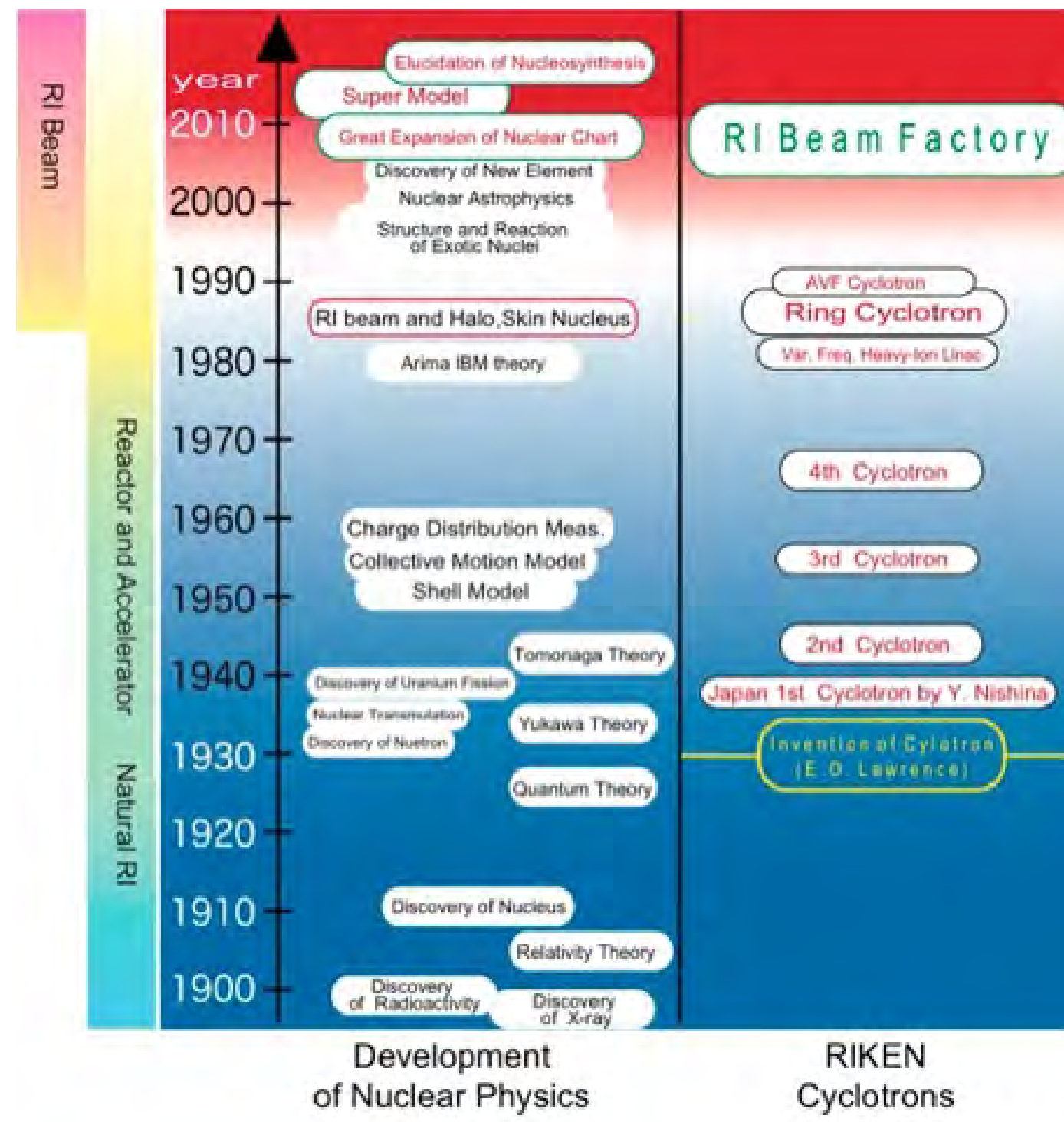
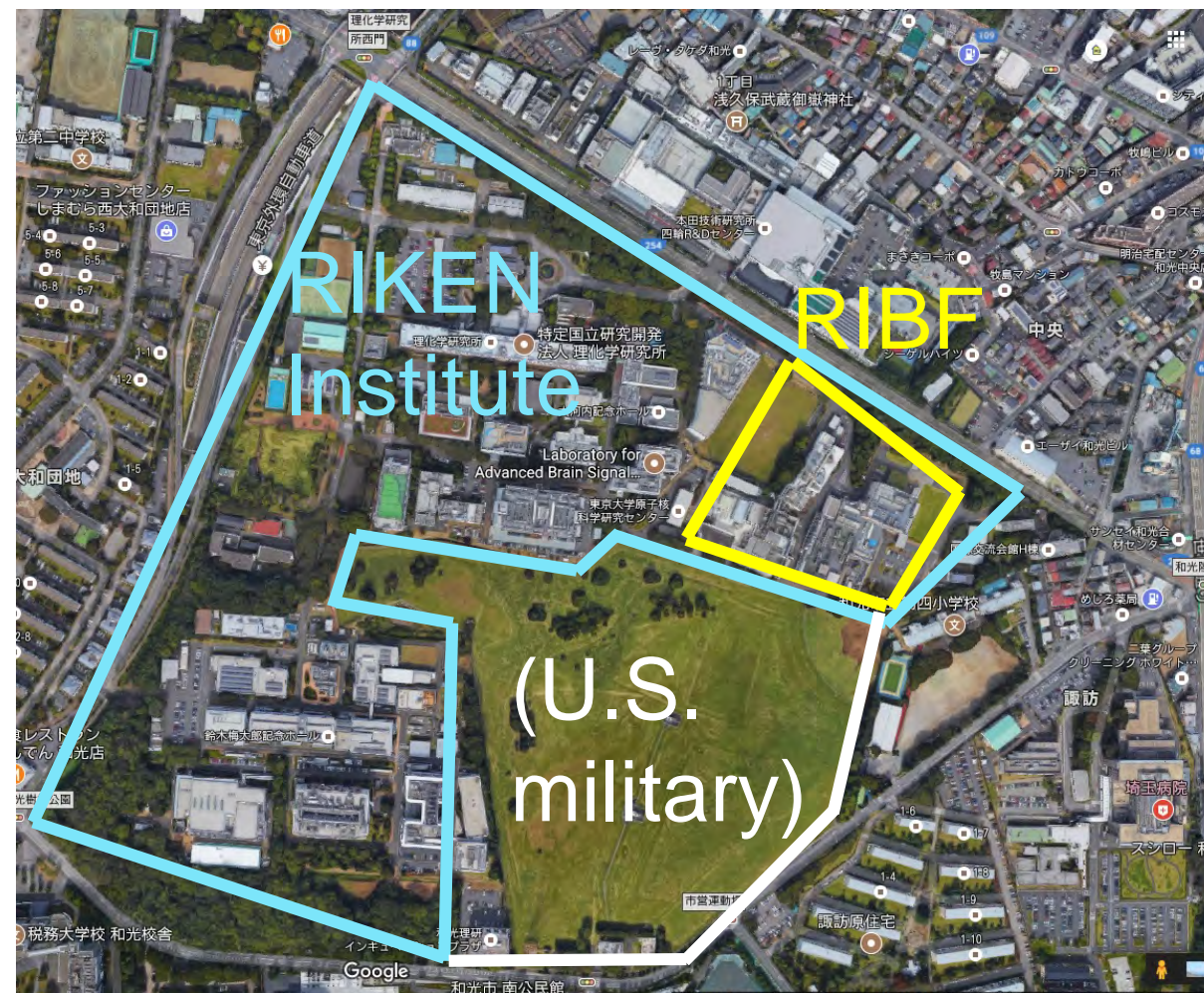


## General information

RIKEN is Japan's largest comprehensive research institution founded in 1917 in TOKYO for high-quality research in a wide range of science. In 1937, Yoshio Nishina of RIKEN constructed the first cyclotron in Japan, which is the second in the world, for research on nuclear physics, nuclear chemistry, and radiobiology.

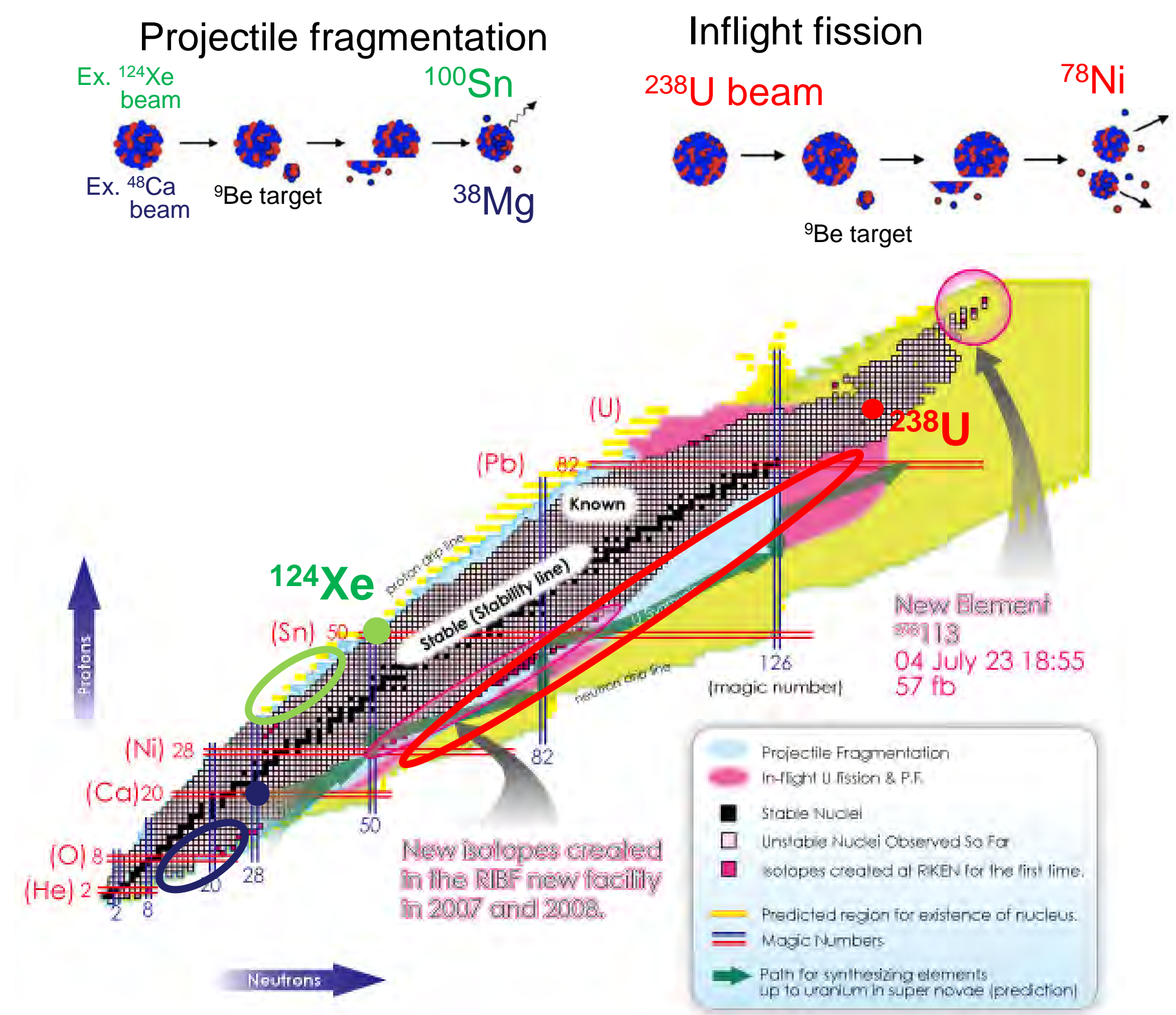


Since the construction of the first cyclotron, RIKEN has constructed six cyclotrons. Currently the Nishina Center is operating ring cyclotron (RRC, the 5<sup>th</sup> cyclotron), AVF cyclotron (the 6<sup>th</sup>), fRC (the 7<sup>th</sup>), IRC (the 8<sup>th</sup>), and SRC (the 9<sup>th</sup>) at Wako campus of RIKEN in Saitama prefecture, Japan.

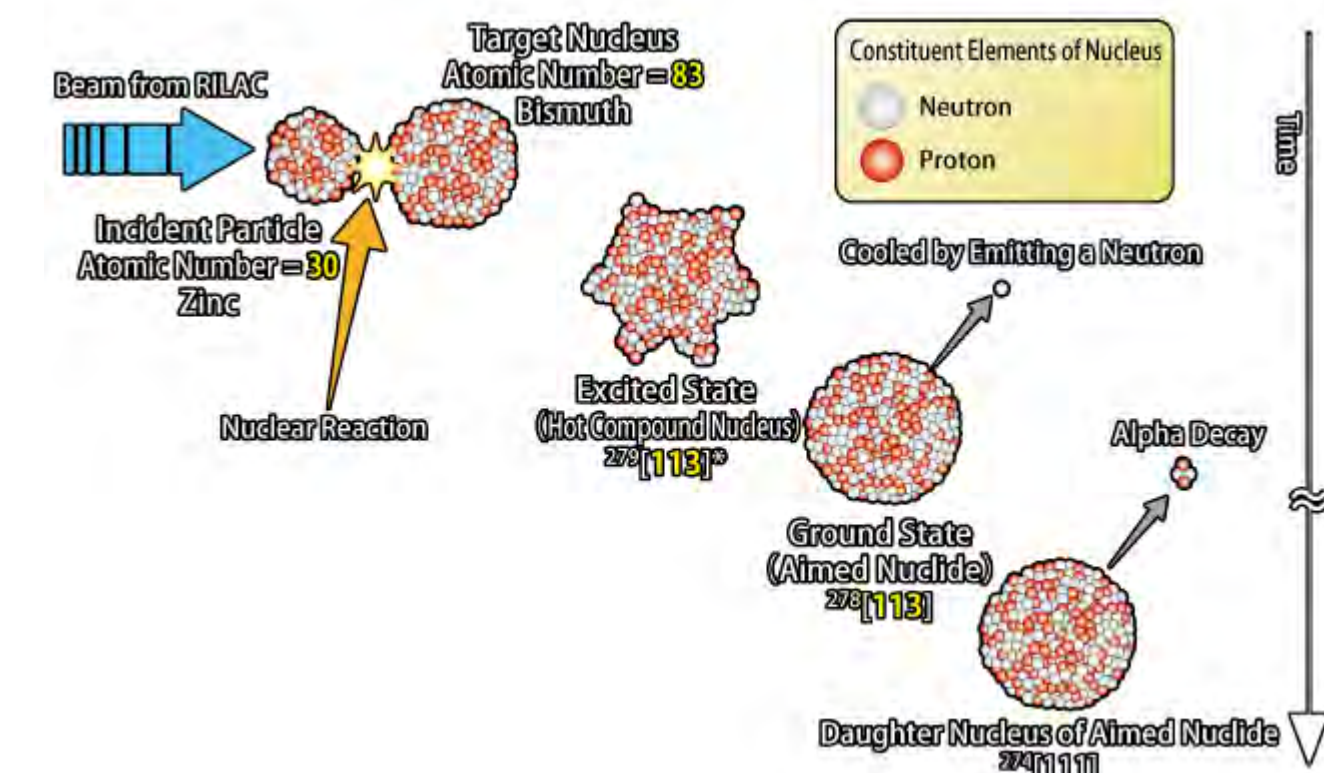


## Science

• Nuclear physics, nuclear astrophysics by RI beam

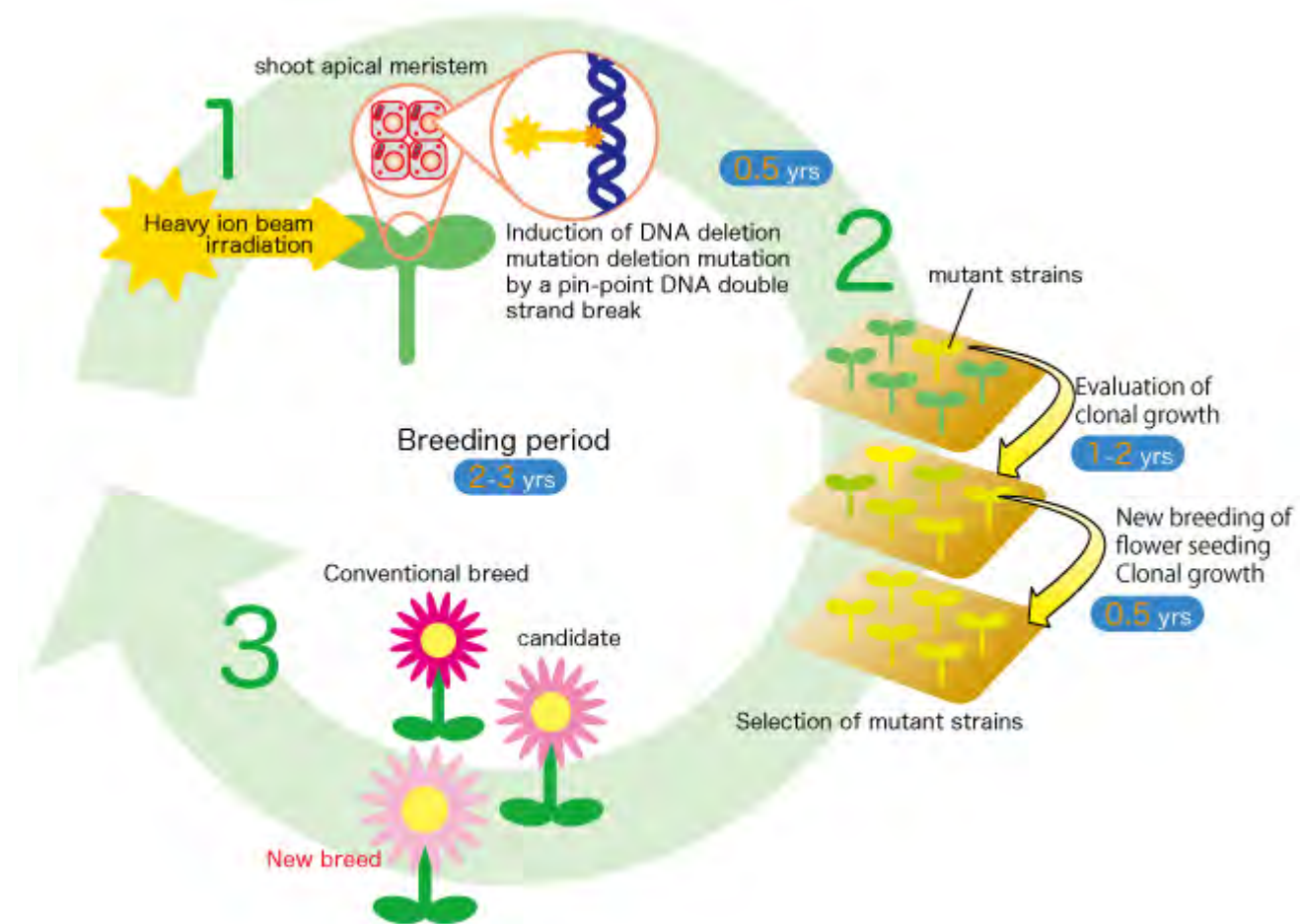


• Discovery of new element

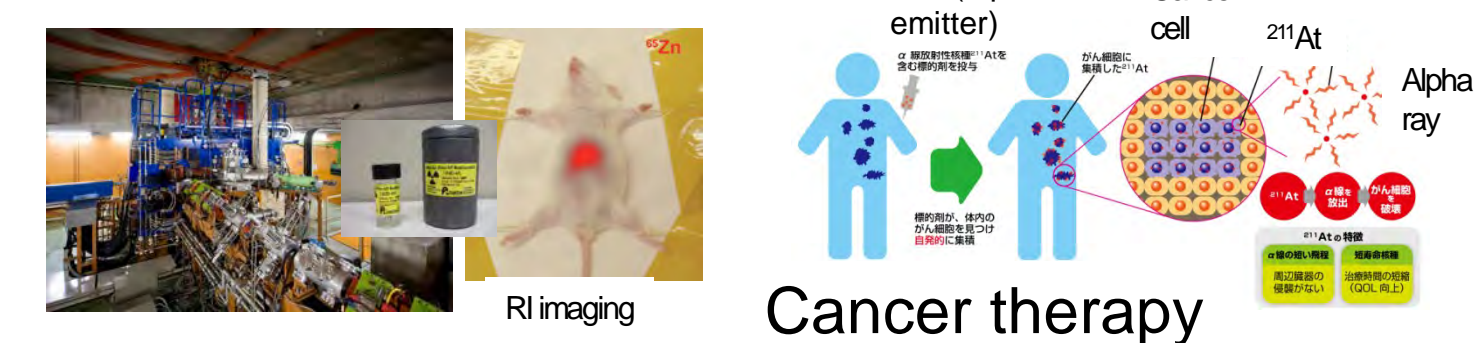


• Applied research

Heavy-ion beam breeding



RI production for research, medicine, etc.



## Facility

The Radioactive Isotope Beam Factory (RIBF) is a cyclotron accelerator facility to generate intense beams of a wide range of radioactive isotopes. The aim of the RIBF is to expand our knowledge of highly unstable exotic nuclei in relation to nuclear physics and nuclear astrophysics. The world's first superconducting ring cyclotron (SRC) is located at the end of the series of four cyclotrons. SRC provide beams of heavy ions from hydrogen to uranium with an energy of about 350 A MeV.

The primary beams are injected into the target of the BigRIPS superconducting separator. Intense RI beams of world best are produced by projectile fragmentation of the various heavy-ion beams or by in-flight fission of uranium ions.

Purpose: Basic Science Research (Nuclear physics, Nuclear astrophysics, Nuclear chemistry, radiobiology), RI production etc.

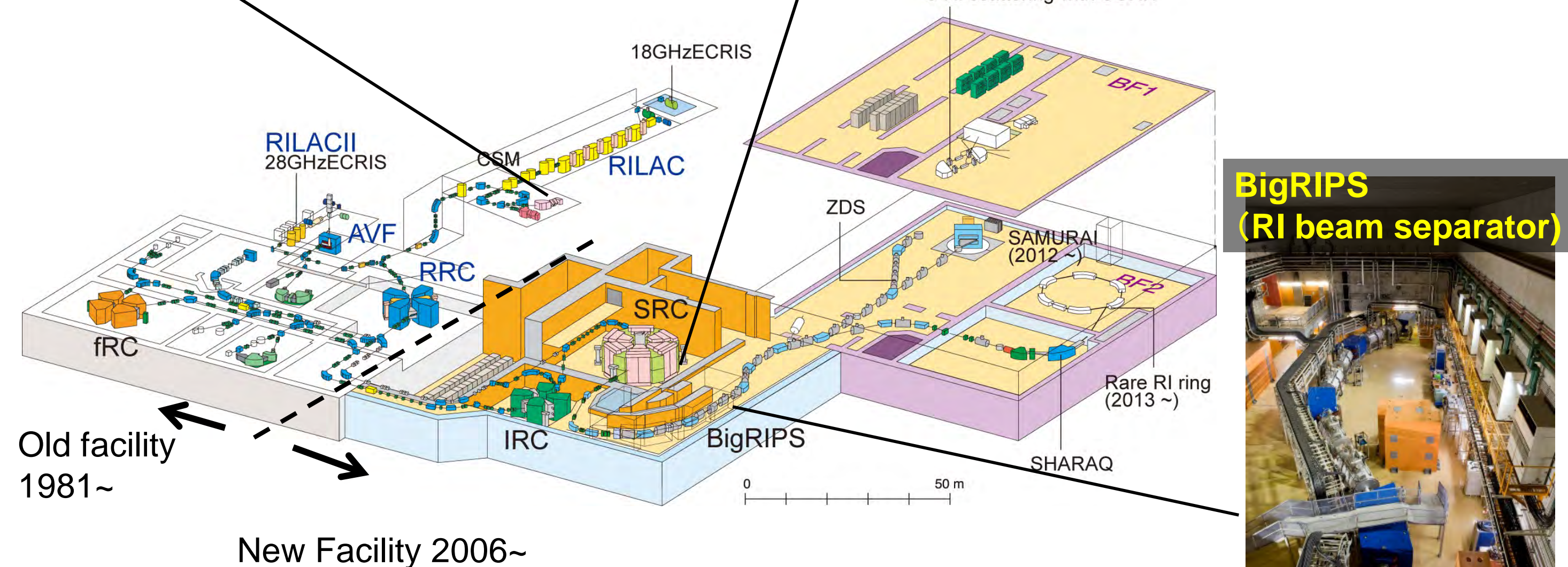
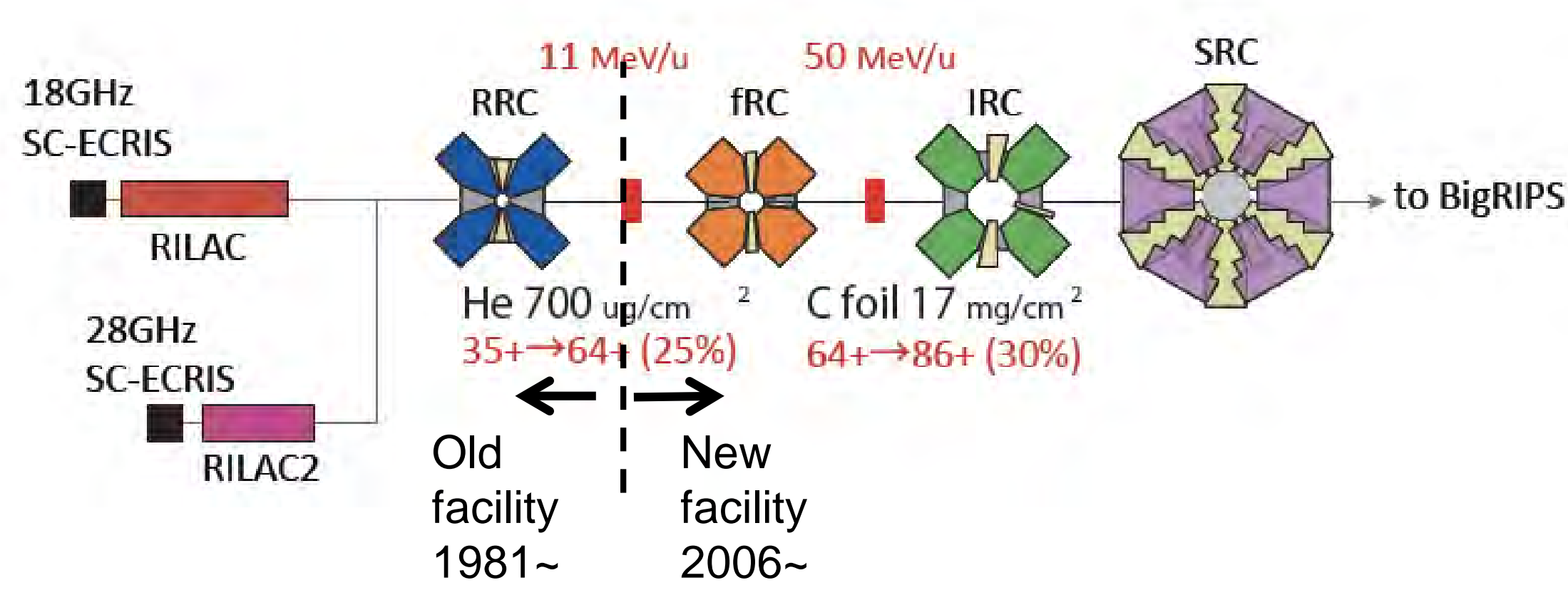
Beam: heavy ion of H, O, Ca, Zn, Xe, U etc.

Energy: ~350MeV/nucleon

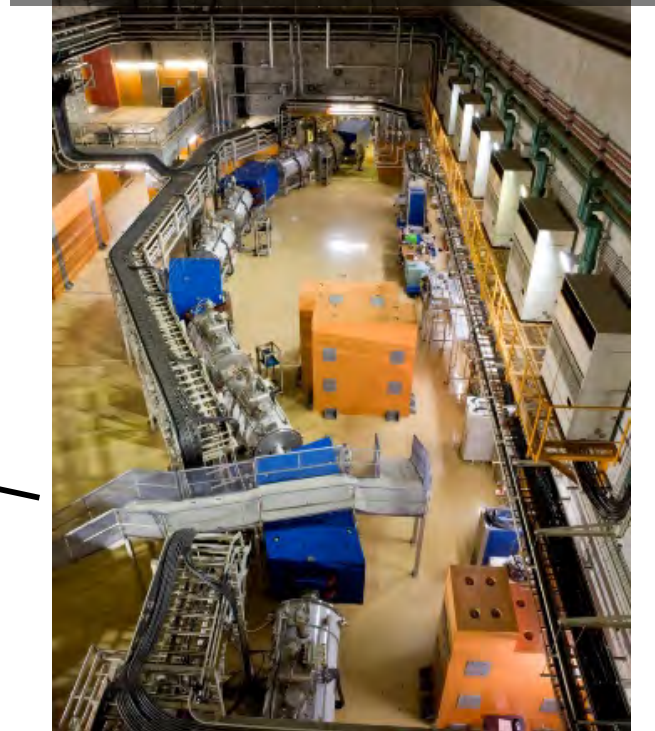
Goal intensity: 1 particle  $\mu\text{A}$  ( $6 \times 10^{12}$ pps, 80kW in  $^{238}\text{U}$  beam)

### Accelerator in RIBF

- Heavy ion lilac  $\times 2$
- Heavy ion cyclotron  $\times 5$  AVF  $\times 1$ , Sector type  $\times 4$
- electron accelerator  $\times 2$  150 MeV microtron, 700 MeV synchrotron storage ring



BigRIPS (RI beam separator)



(Target, beam dump)