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Recent results from the field of superheavy element research in Europe ANDREAS TUERLER, Paul Scherrer Institute & University of Bern, TASCA COLLABORATION[1] — With the discovery of six new elements in the past decade an extraordinary expansion of the Periodic Table took place, so that now all elements of the 7th period have been synthesized. This success was possible by exploiting the concept of "warm" fusion using the available, neutron-rich actinide target materials and the tightly bound, doubly magic projectile ^{48}Ca [1]. Most of these discovery experiments were conducted by the Dubna-Livermore collaboration at the Flerov Laboratory in Dubna, Russia and a number of independent experiments have been able to confirm these findings [2-5]. In this contribution I will highlight different nuclear aspects of superheavy element research in the context of experiments performed by the TASCA collaboration. Attempts to push beyond Z=118 using the reactions ^{50}Ti + ^{249}Bk and ^{50}Ti + ^{249}Cf have failed so far, while reaching rather low upper limit production cross sections. It appears, as if only new, more powerful accelerators and associated experimental equipment would allow the synthesis of even heavier elements in the 8th row of the Periodic Table. Noteworthy is also the possible observation of X-rays in the alpha-particle decay chains of element 115 isotopes [6], paving the way towards X-ray fingerprinting of new elements. [1] Yu.Ts Oganessian, J. Phys. G: Nucl. Part. Phys. 34, R165 (2007) [2] L. Stavsetra et al., PRL 103, 132502 (2009) [3] Ch.E. Duellmann et al., PRL 104, 252701 (2010) [4] S. Hofmann et al., EPJA 48, 1 (2012) [5] J. Khuyagbaatar et al., PRL 112, 172501 (2014) [6] D. Rudolph et al., PRL 111, 112502 (2013)

[1]a GSI - Mainz - JAEA - ORNL - Liverpool - Canberra - Lund - LBNL - LLNL - Nashville - SAHA - Oslo - Jyväskylä - PSI - Bern - IET collaboration

Andreas Türler
Paul Scherrer Institute & University of Bern

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