

PHYSICS NEWS FLASH

Chameleon Nuclei

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Physics Professor [Witek Nazarewicz](#) is co-author of a new *Nature* paper proposing that super-heavy nuclei may have a chameleon-like quality that helps them survive.

The super-heavy elements are those with large atomic numbers and relatively short lives. Within the nucleus of all elements, protons and neutrons together make up nearly all the mass of an atom. But in the super-heavies, particularly, the particles don't get along so well. Although they're bound together by the strong nuclear force, the repulsion between the positively charged protons threatens to break these heavier nuclei apart much more quickly than the lighter nuclei found in natural occurring elements.

However, with his colleagues Stefan Cwiok of the Warsaw University of Technology and Paul-Henri Heenen of the Université Libre de Bruxelles, Dr. Nazarewicz proposes that by changing their shape these unstable nuclei can, for a time, outsmart the natural process of fission and survive a bit longer.

In "Shape coexistence and triaxiality in the superheavy nuclei," published in the February 17 issue of *Nature*, the trio predicts that "long-lived superheavy elements can exist in a variety of shapes—spherical, axial and triaxial configurations." They also put forth the idea that these shapes can make identical elements decay in very different ways, which can complicate the journey as researchers seek to fill out the periodic table.