Fragmentation of relativistic nuclei provides an excellent quantum "laboratory" to explore the transition of nuclei from the ground state to a gas-like phase composed of nucleons and few-nucleon clusters having no excited states, i. e. d, t, ^{3}He, and α.

The research challenge is to find indications for the formation of quasi-stable or loosely bound systems significantly exceeding the sizes of the fragments.

Search for such states on the nuclear scale is of undoubted interest since they can play a role of intermediate states ("waiting stations") for a stellar nuclear fusion due to dramatically reduced Coulomb repulsion.

The fragmentation features might assist one to disclose the scenarios of few-body fusions as processes inverse to fragmentation.