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The Role of the rp-Process in Accreting Neutron Stars

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Neutron stars in low mass X-ray binaries accrete enough material during their lifetimes to replace their entire crust. As the accreted material is pushed deeper and deeper into the star it undergoes a sequence of nuclear transformations. In the last ten years, the discovery of new observational phenomena has opened new windows onto these processes and the nuclei involved. In this talk, I will discuss what we're learning about nuclear burning on accreting neutron stars and the properties of the neutron star crust and core, concentrating on the important role of the heavy elements made in the rp-process.