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Anisotropic stars

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Some models suggest that the high-density matter prevailing in neutron star interiors may be significantly anisotropic. Anisotropy is known to affect the bulk properties of nonrotating neutron stars in General Relativity. In this seminar we present the structure of neutron stars, subject to some anisotropic models found in the literature. We review some anisotropic models, as well as their solutions. We show how the anisotropy affects the structure of slowly rotating neutron stars, extending previous nonrotating results to rotating cases. Moreover, we go beyond General Relativity and study anisotropic neutron stars in scalar tensor theories of gravity. We study the effects of anisotropy in the so-called spontaneous scalarization, showing that the anisotropy can considerably change the scalarized configurations. Our calculations suggest that binary pulsar observations may constrain the degree of anisotropy or, even more optimistically, provide evidence for anisotropy in neutron star cores.