

# PHAROS Conference 2020: The multi-messenger physics and astrophysics of neutron stars



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## An HD numerical model of the G21.5-0.9 Pulsar Wind Nebula

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Pulsar Wind Nebulae (PWNe) are powered by the rotational energy lost by the central compact star. Thus they are the perfect place to look at to obtain information on the pulsar in case of a non-direct identification. Multidimensional MHD numerical models of Pulsar Wind Nebulae (PWNe) have been shown to be extremely successful at accounting for a large variety of properties of those sources, down to very fine details. Unfortunately a complete description of the entire structure of a PWN, from the inner nebula to the outer part, is only possible with 3D models, which are very demanding in terms of time and numerical resources. Thus, in practice, they cannot be invoked as a possible tool for investigating large sets of different objects nor old systems. In addition, the connection between HD/MHD models and radiative models has not been explored in detail, and there is not a versatile prescription for this model linkage.

In this talk I will present our efforts in this sense and, in particular, show a prescription for combining HD simulations with radiative properties, and its application to the G21.5-0.9 nebula.

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