



TECHNISCHE
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Physikalisches Kolloquium

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| Title: | Thermonuclear supernovae: how to blow up a white dwarf star |
| Speaker: | Prof. Dr. Stuart Sim, Queen's University, Belfast, Northern Ireland, United Kingdom |
| Date & time: | Friday 04.07.2025, 2 pm |
| Location: | ZKS-Uhrturmhörsaal, S2 08, R. 171, Hochschulstraße 4 |
| Host: | Prof. Dr. Gabriel Martínez Pinedo |

Abstract:

Aside from being spectacular displays in their own right, Type Ia supernova explosions have a key role in measuring the expansion history of the Universe and synthesizing the iron group elements.

But what is their origin? That thermonuclear supernovae arise from exploding white dwarfs is relatively well-established but the manner in which the explosion is ignited and how this can be determined from what we observe remain hotly debated issues.

I will discuss the theoretical modelling of thermonuclear supernovae with particular focus on how our work on multi-dimensional radiative transfer simulations can be used to test explosion scenarios.

I will argue that understanding the diversity of thermonuclear supernovae requires us to investigate a variety of different progenitor scenarios and review selected results from our work on both Chandrasekhar-mass white-dwarf explosion models and sub-Chandrasekhar scenarios.

