**Congreso de Métodos Numéricos en Ingeniería (CMN2026)**
*July 1–3, 2026 – Gijón, Spain*

# STEEL AND COMPOSITE STRUCTURES

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## ABSTRACT

The aim of this proposal is to gather, in a thematic session of the conference CMN2026, interesting and new numerical research works dealing with the mechanical performance of steel and composite structures applied in civil engineering.

Numerical simulations have been widely applied for the determination of the resistance of steel and composite structural elements, connections and entire structures. This has been occurring when experimental analyses are not possible (due to cost or size limitations) or when parametric studies with high number of variables are needed.

In addition, the increase of knowledge on the numerical prediction of different mechanical phenomena (e.g. failure mechanisms, instabilities phenomena, etc.), occurring in buildings or other civil engineering structures, are of the utmost importance for the safety assurance of people and property.

While steel and steel-concrete composite structures are widely used in practice, owing to their excellent mechanical properties and design flexibility, the recent innovations introduced in the construction sector need to be characterized by means of numerical models capable to reproduce their realistic behaviour, increasing the need for promoting the research progress on the topic. High-performance materials (i.e. high-strength steel and concrete), new stainless steel grades or sustainable solutions using timber in composite/hybrid structural elements will be considered within this topic.

Research works related with numerical simulations of entire structures, structural elements (beams, columns and beam-columns of different cross-sections shapes and slendernesses) and connections in steel and composite construction, will be the object of this thematic session. New construction systems and solutions that contribute to the circular economy principles and sustainable practices will also be explored. The influence of the consideration of different actions, such as the ones resulting from dynamic loading (e.g. seismic, impact, imposed vibrations, etc.), thermal loading (e.g. fire, explosions, etc.) or others, on those structures or structural components are also important aspects to be addressed in this session.