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PLASTICITY AND THE AIRFRAME -- AIRCRAFT STRUCTURE FROM BIRTH TO ULTIMATE STATE

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ABSTRACT

From the beginning of metallic airframes in the 1930's until today, it has always been required to have a thorough understanding of the plastic behaviour of aircraft structure. Nowadays, advanced models of plasticity are used along the entire design and development process: they are needed to compute the ultimate state of the structure for certification, and also to simulate the manufacturing of the often complex, double-curved components. Mastery of this chain has helped to create the safest mode of transport humankind has known so far. This talk will recap some of the history that got us to where we are today, to help understand current practice, and it will sketch future needs and possibilities. As in the past, the collaboration between academic research and the aerospace industry will continue to be the key to safety, comfort and sustainability.