

The materials age

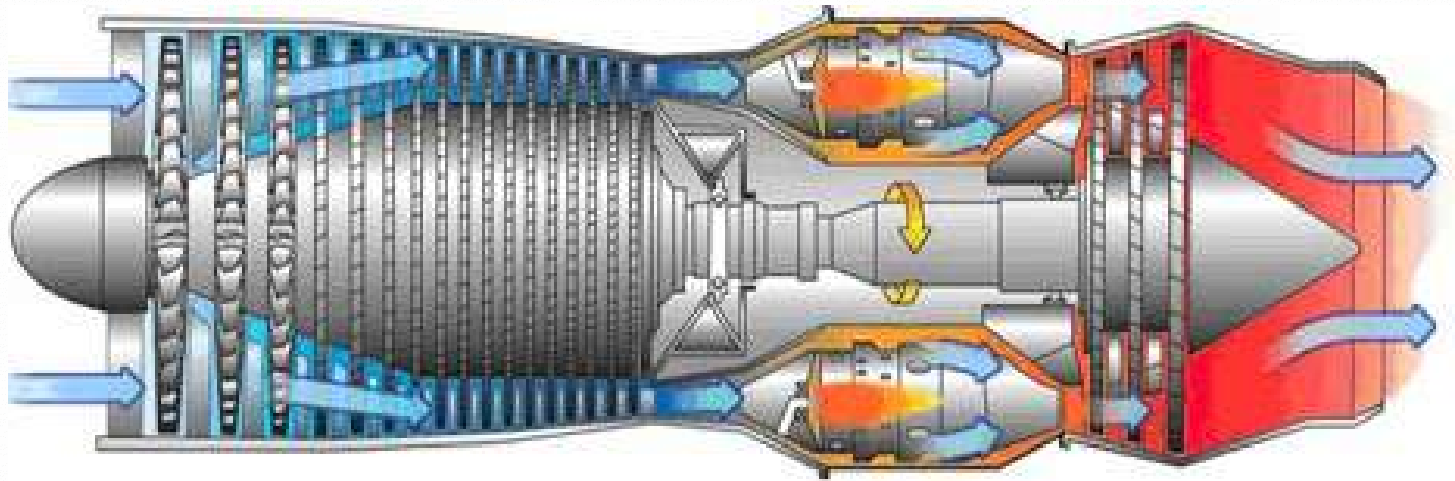
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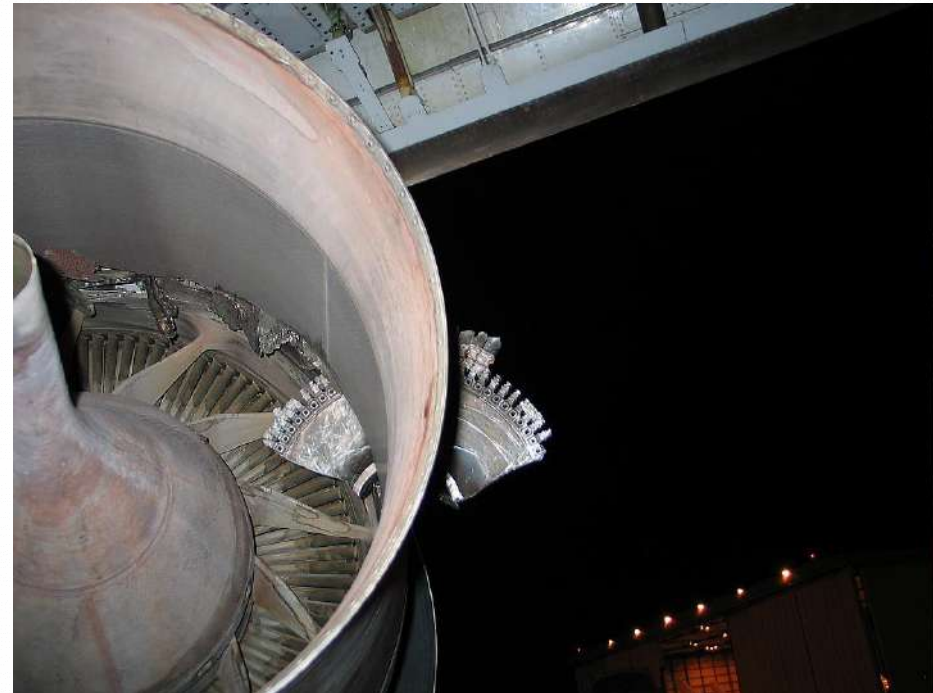
Modern materials: alloys



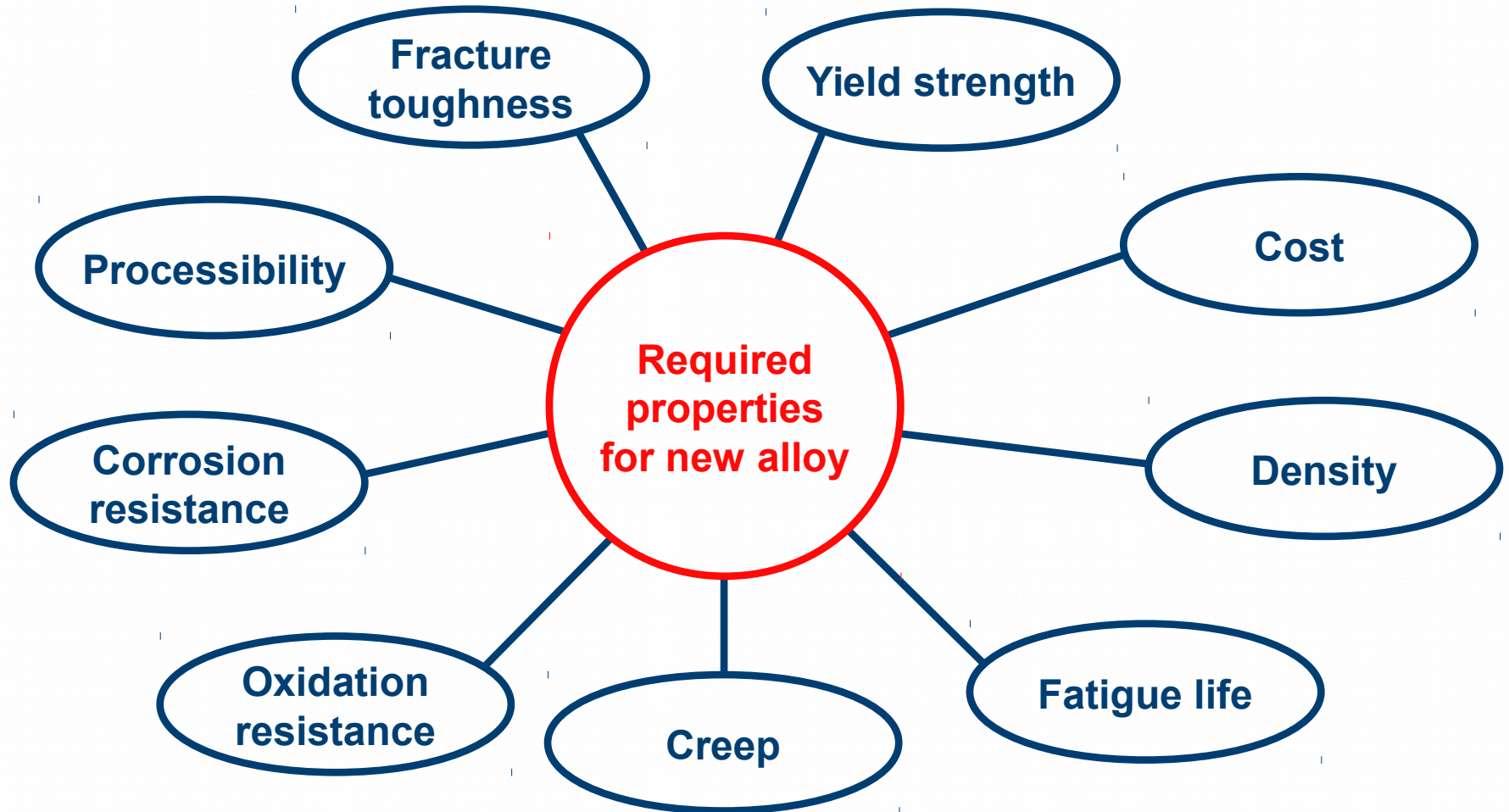
Jet engine: military jet



Jet engine: turbine discs



Designing a new alloy – what is required ?



Multidimensional design space

Cr



Co



Mo



W



Ta



Nb



Al



Ti



Fe



Mn



Si



C



B



Zr



Cu



N



P



V



Hf



Mg

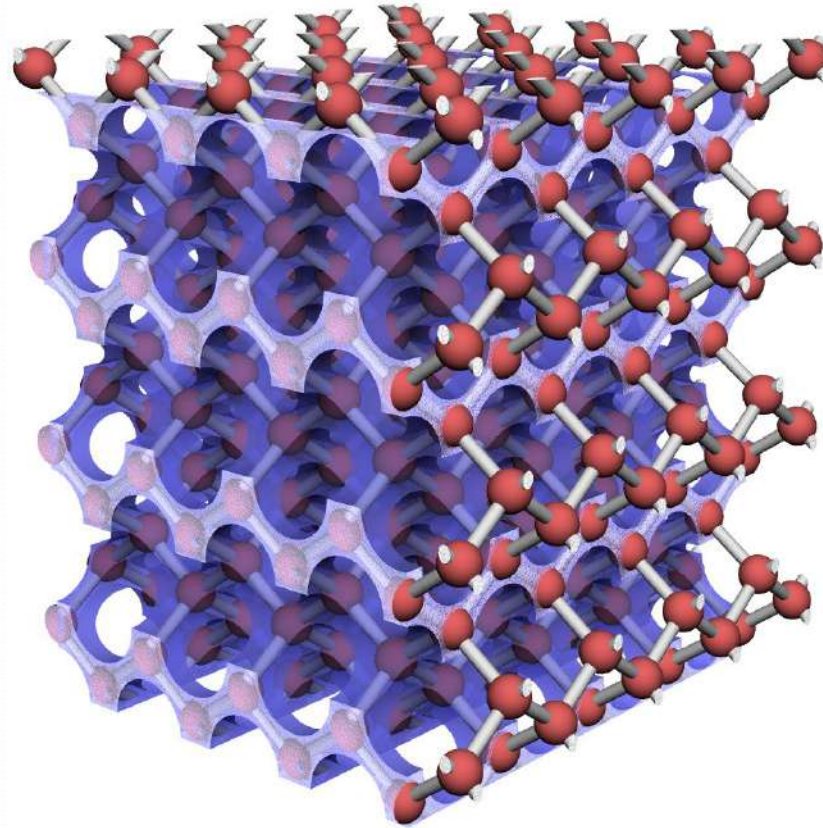


Ni

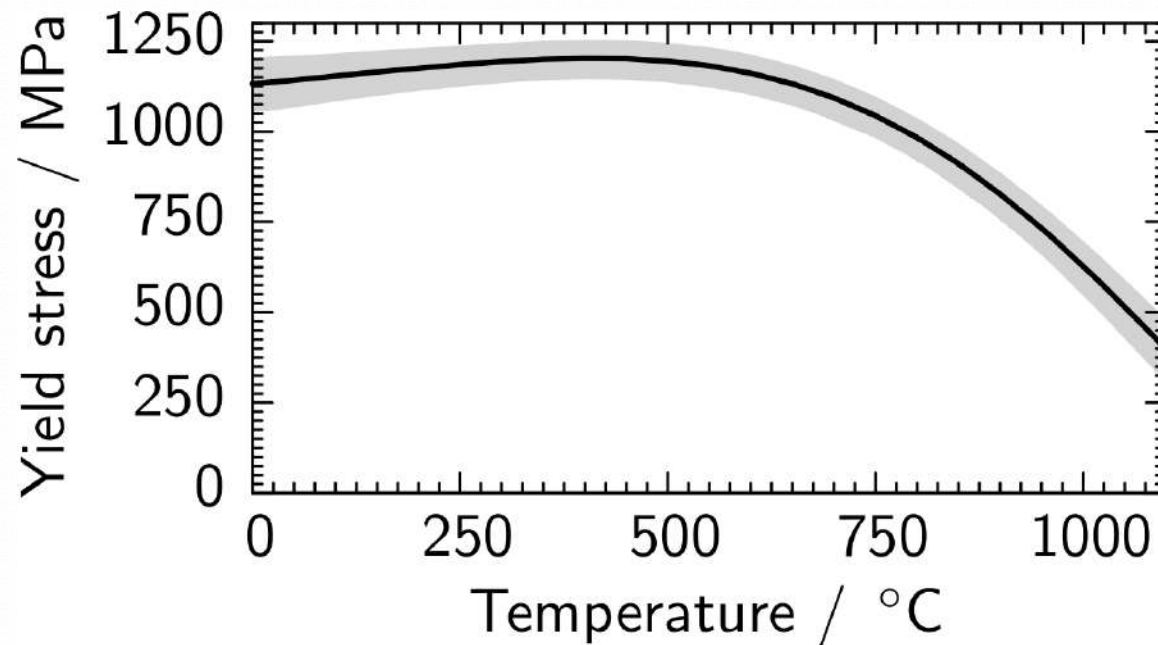


and 4 different manufacturing processes

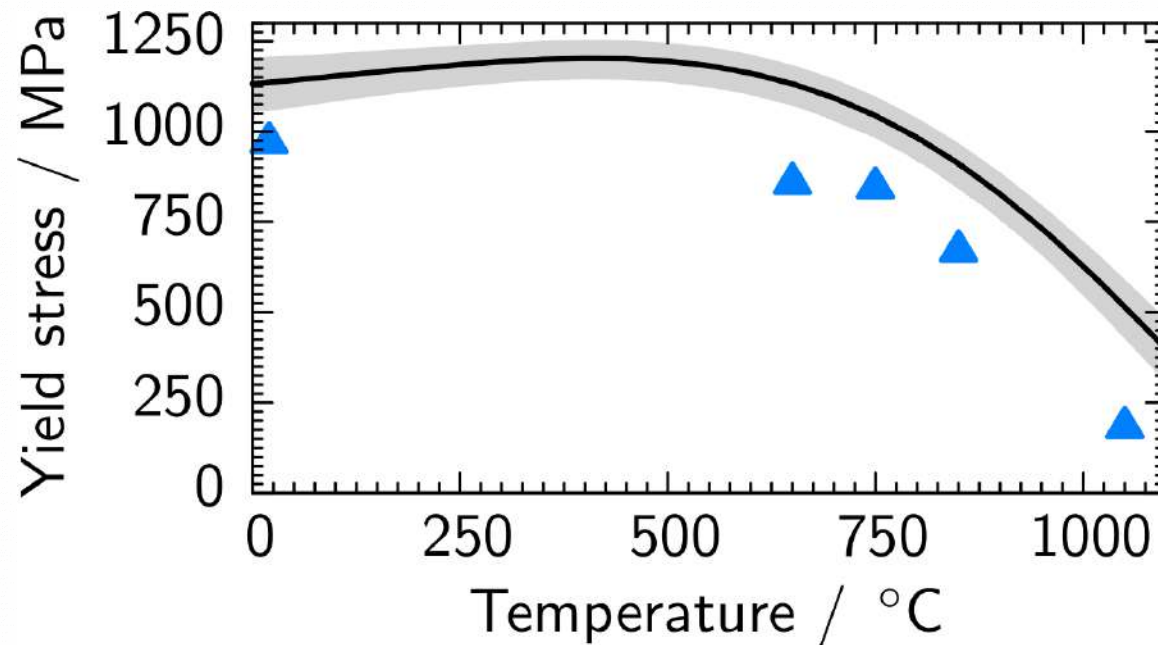
Calculating material properties



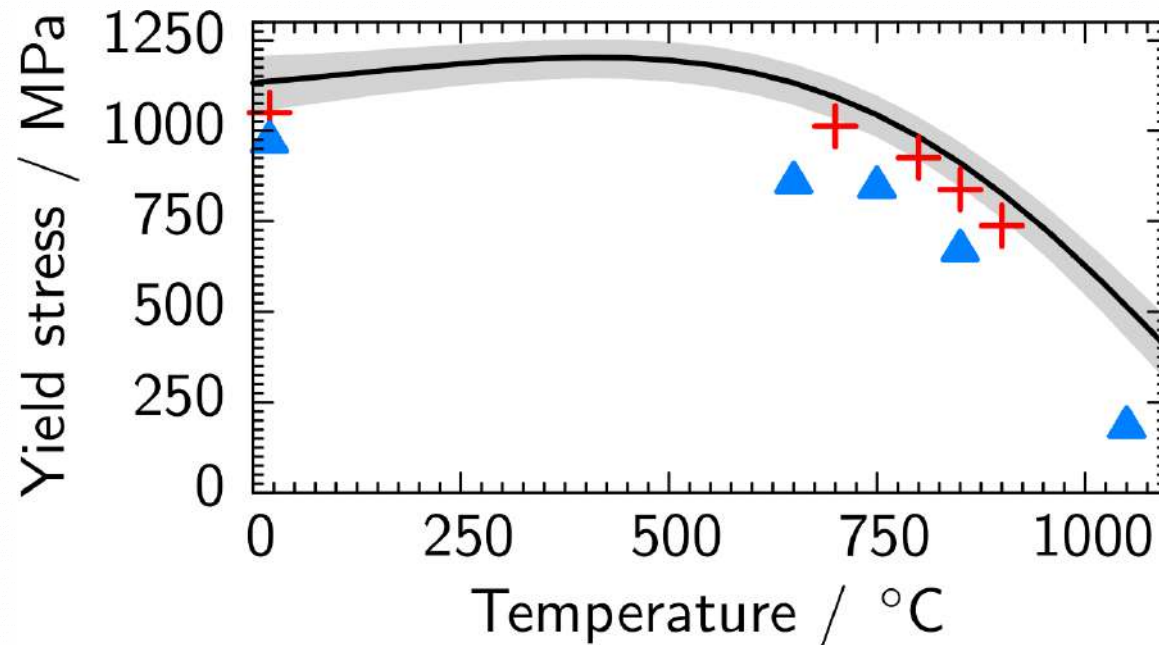
Testing the yield stress



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Testing the yield stress



Conclusions: why study condensed matter?

- Union of different sciences that encourages analysis with a variety of techniques – analytical, numerics, and experiments
- Close connection to real-world problems
- Academic funding and well-paid industrial jobs