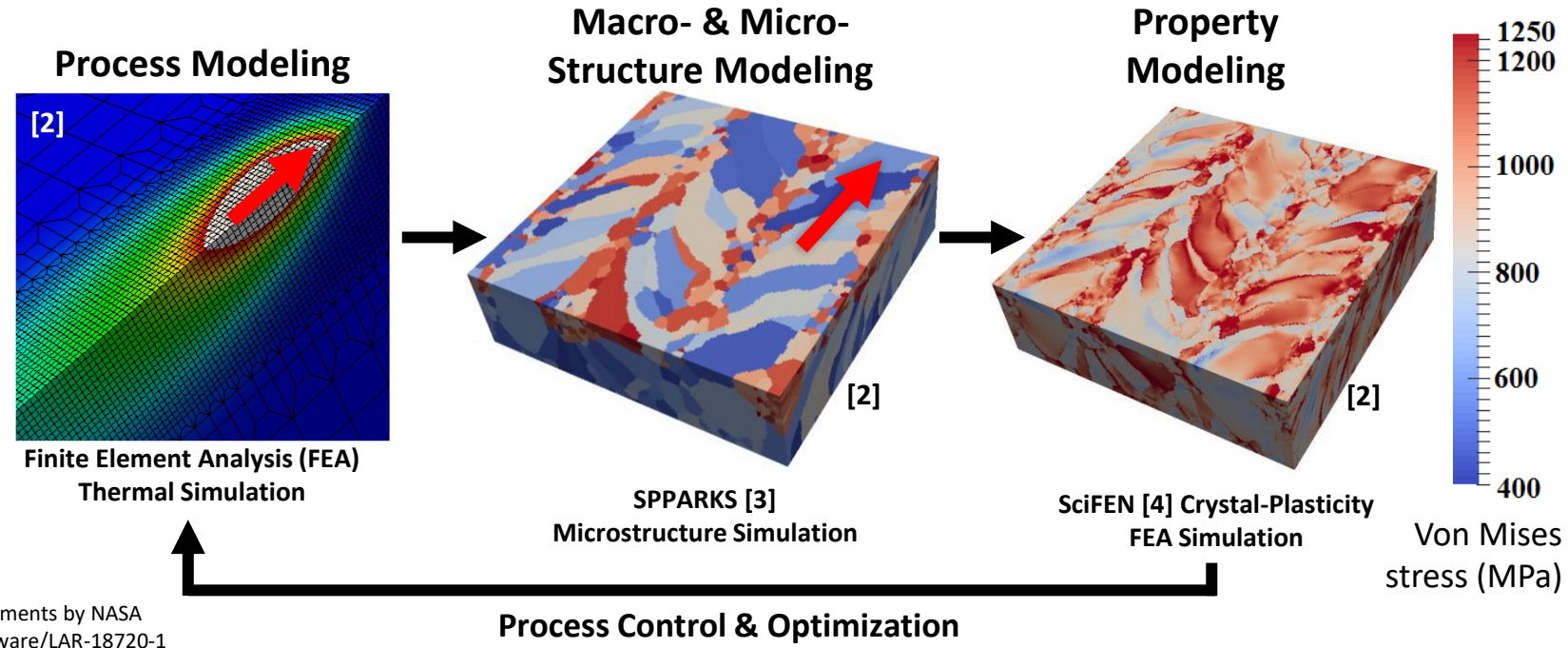
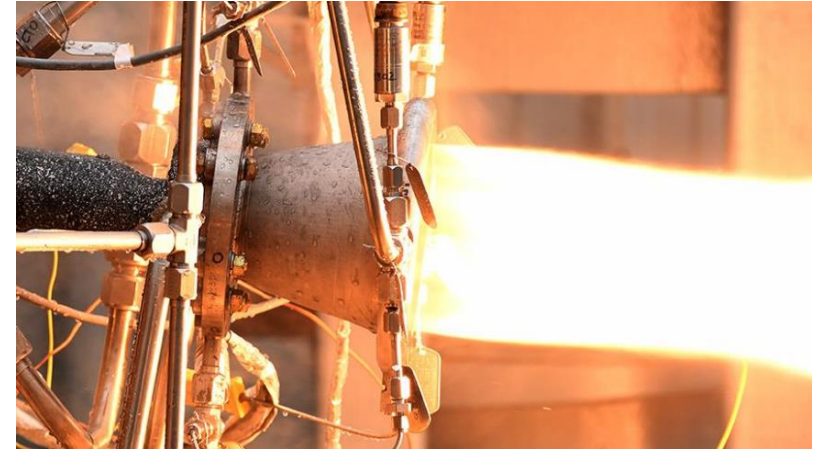


Additive Manufacturing (AM) **P**rocess-**S**tructure-**P**roperty (PSP) Frameworks

Qualification and Certification of aerospace components requires an understanding of the sources of variability in additive manufacturing processing and mechanical properties

- Additive manufacturing has many opportunities for improving aerospace components
- Current paradigm for Qualification and Certification of AM components is very costly, time consuming, and is not extensible beyond the precise conditions considered
- It is necessary to have traceability and predictability between processing and final properties of AM parts
- NASA Langley Research Center is developing PSP frameworks for next-generation computational-materials informed Q&C of additively manufactured aerospace components

Hot-Fire
Testing of
Additively
Manufactured
Inconel 625
Nozzle
[1]



[1] P.R. Gradl et al., "Additive Manufacturing Development...", (2019), Available on the NASA Technical Reports Server (NTRS) (NTRS #20190030432), Figure 9 modified from original

[2] S.R. Yeratapally, "Integrated Computational Materials..." (2020) Available on the NASA Technical Reports Server (NTRS) (NTRS #20205001613) Figures from Slide 12 modified from original

[3] Stochastic Parallel PARTICle Kinetic Simulator (SPPARKS), <https://spparks.github.io/>
[4] SCAlable Implementation of Finite Elements by NASA (SciFEN), <https://software.nasa.gov/software/LAR-18720-1>