

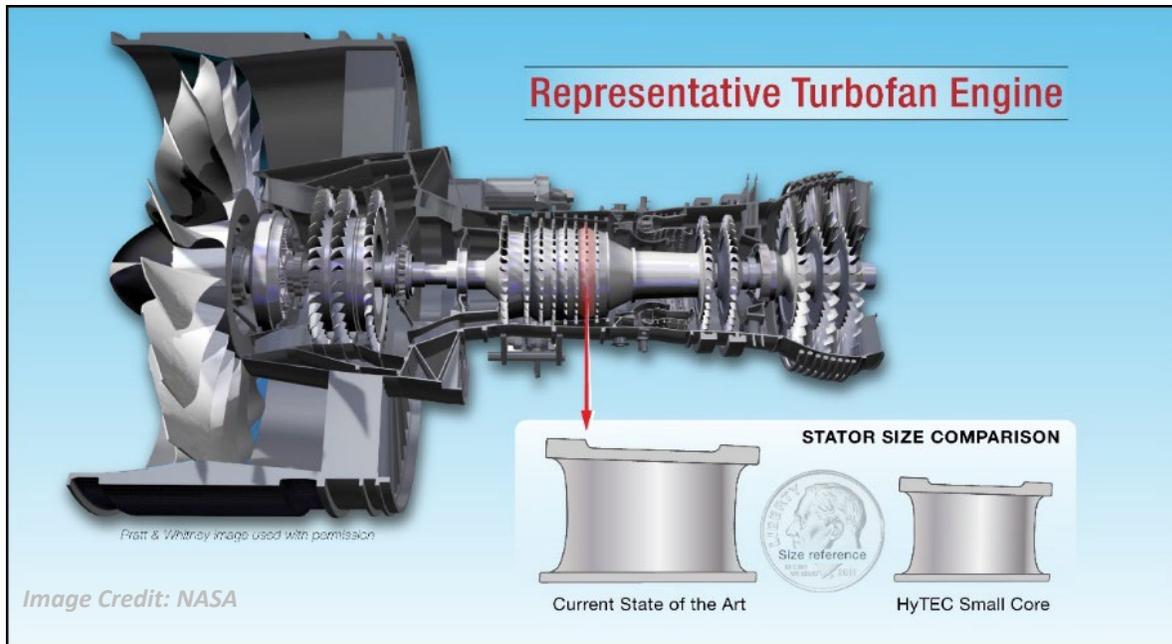
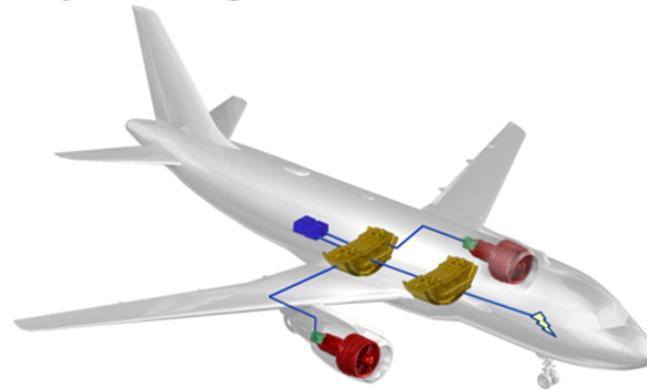
# My NASA University Leadership Initiative Experience



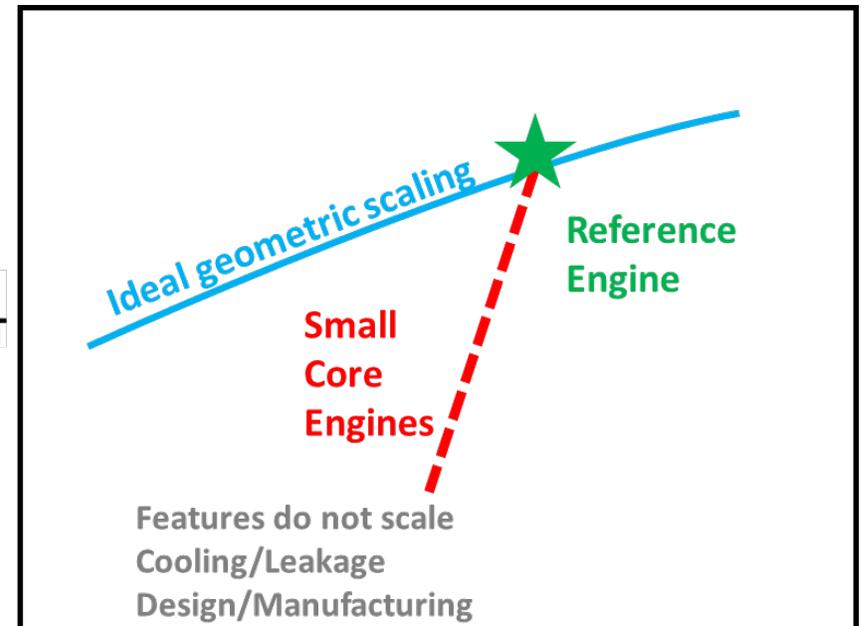
Maria Rozman, PhD Candidate



# NASA goals and industry targets are to develop a highly efficient gas turbine with a reduction in the core size requiring accurate measurements of efficiency



$$\Delta\eta_{HPT}$$



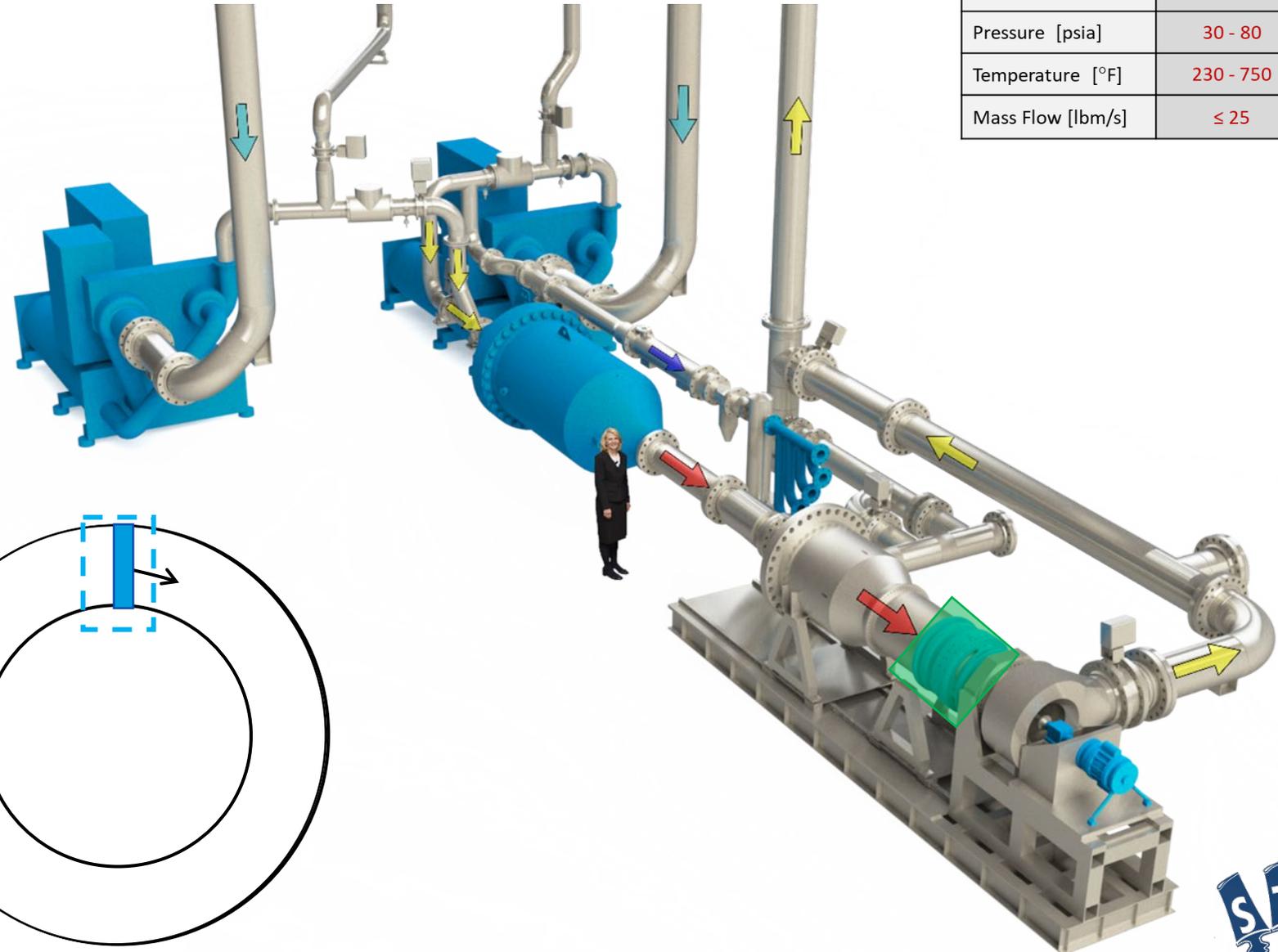
**Core Size**



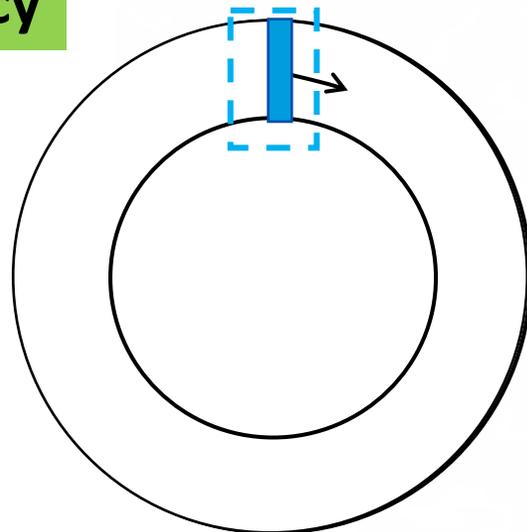
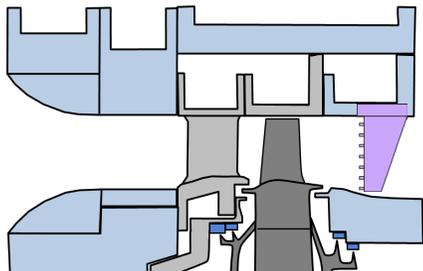
# START is a continuous duration turbine test facility at relevant engine conditions



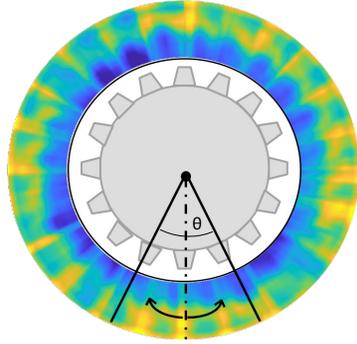
Turbine Conditions	Main Gas Path	Cooling Air
Pressure [psia]	30 - 80	30 - 80
Temperature [°F]	230 - 750	> 30
Mass Flow [lbm/s]	≤ 25	< 3



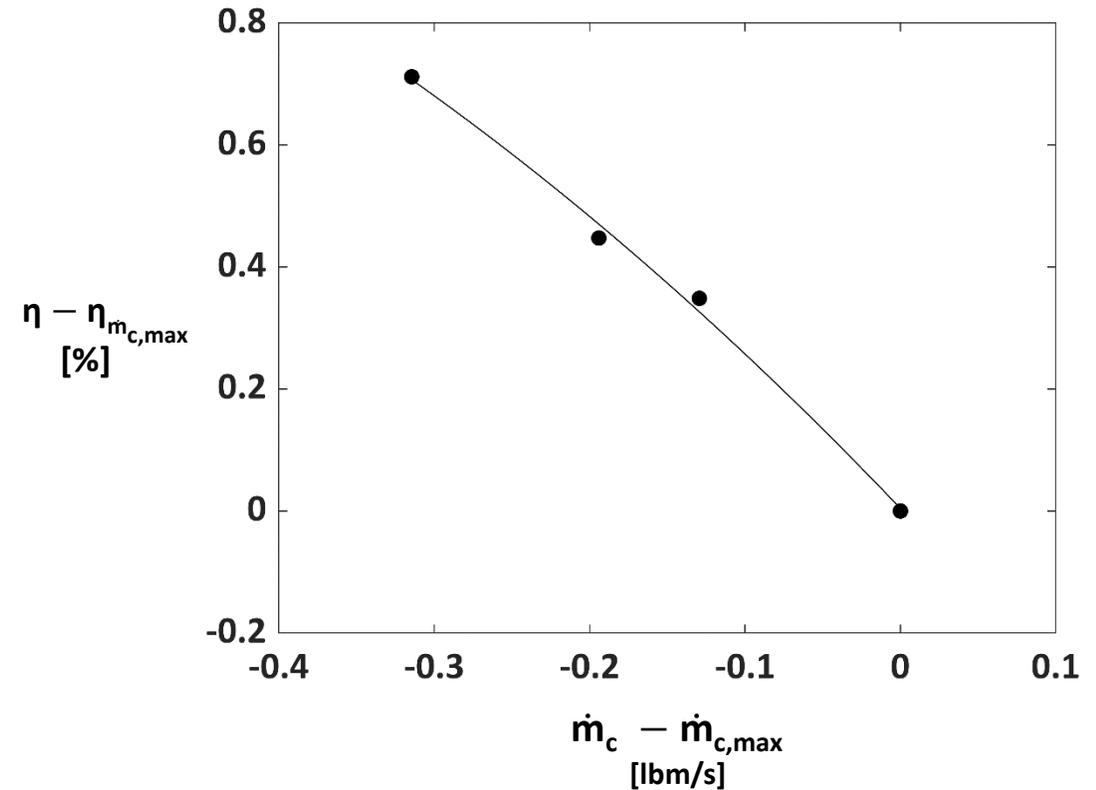
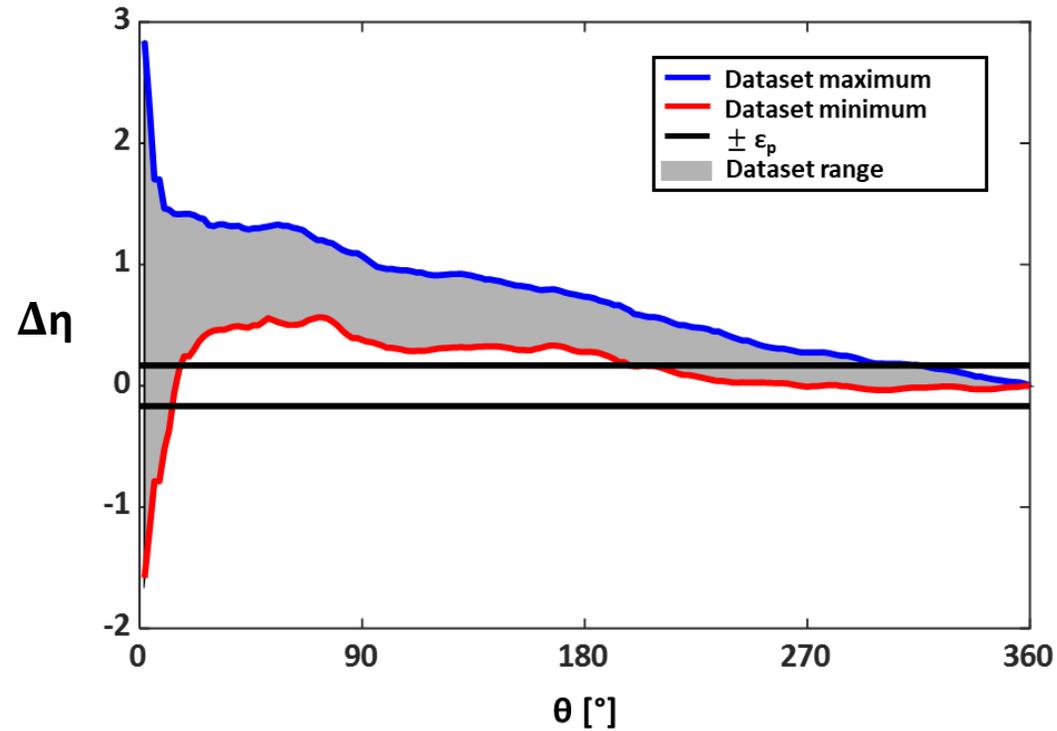
## Stage thermal efficiency



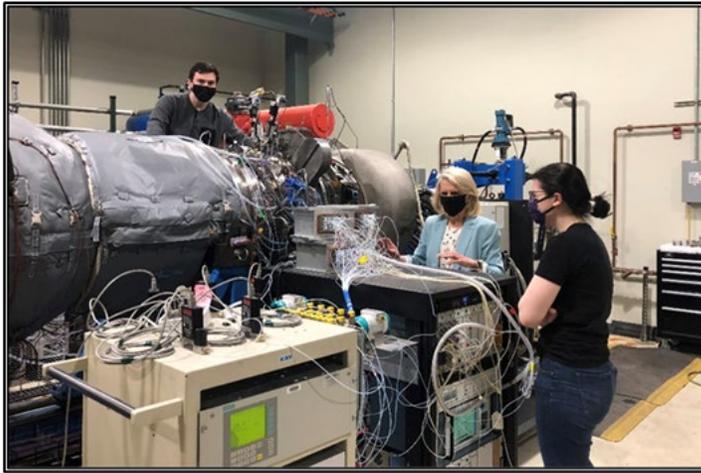
My research determined the most accurate measure of stage efficiency was fully-resolved pressures and temperatures over the full 360° annulus



$$\eta = \frac{[\dot{m}_{MGP} h_{MGP,1} + \dot{m}_c h_{c,1}] - [(\dot{m}_{MGP} + \dot{m}_c) h_2]}{[\dot{m}_{MGP} h_{MGP,1} + \dot{m}_c h_{c,1}] - [\dot{m}_{MGP} h_{MGP,2s} + \dot{m}_c h_{c,2s}]}$$



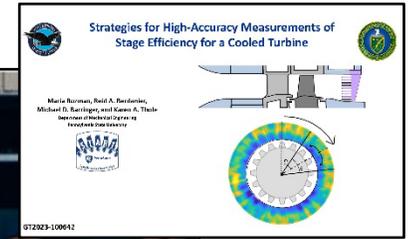
# Working on a NASA ULI funded project has opened the door for me to many opportunities for personal growth and professional development



Operating a one-stage turbine



Present my work at industry meetings and professional conferences



Learn and be mentored by industry through an internship and seminars

**PennState** College of Engineering | Center for Gas Turbine Research, Education, and Outreach  
**Gas Turbine Seminar Series**  
 Corporate Savvy – Engineering, Politics, and Money...  
 (yes, it all goes together)



**Susan Scofield**  
 Vice President of Business Operations for North America  
 Siemens Energy Gas Services



Advise and mentor undergraduate researchers through the NASA/NSF REU

