**10 Ideas**

***What new combinatorial processing methods can be used to create new materials?***

1. **Controlling polymer entanglement prior to fiber spinning using temp., pressure, electric and/or magnetic field FF**
2. **Combine net shape extrusion with concurrent pre-alignment forces (electric, magnetic ultrasound) FF**
3. **Combining synthesis with additive manufacturing-“synthesis and processing integrated FF**
4. **Concurrent synthesis and processing, e.g growth of continuously reinforced MM composites.. FF**
5. **Combine synthesis, processing and net shape including biosynthesis techniques FF**
6. **Combine laser processing with traditional processing methods of polymers, metals and ceramics because depending on laser parameter photochemical, physical or thermal effects can be realized on the material. FF**
7. **Survey of processing techniques and what effects they have on material chemistry, morphology, architecture with a goal of reducing the list. TL Some processing techniques are more available or viable, need method to rank. TL**
8. **Combine temp., pressure forming with joining, bonding, welding. FF**
9. **Process 2 or more materials with a single process that may utilize multiple methods simultaneously, e.g hybrids or laminates. FF**
10. **Design for repurposing, combine processes for fabrication, processing for another application and/or recycling. FF**
11. **Nonequilibrium processing methods…metastable materials e.g., bulk metallic glasses, high entropy alloys FF**

**“Empirical experimental approach or model optimum electronic structure. “ D. Bushnell 6 22 2016**

**We should only lead NASA unique mission specific technology development activities**