



Exceptional service in the national interest

# SNL-CA AM Capabilities

Org.8524

Manuel Antonio Lopez



# Introduction

## Brief bio

- AM Services Provider Lead
- *in situ* diagnostics with Computers simulations to understand residual stress for more consistence Ti parts

## Current research

- Lattice large file size into STEP
- We need to strengthen collaboration
- Research to reduce lack of data

## Areas to collaborate

- Make the most of current capabilities
  - Melting Pool and Software Analizuz
- SNL would like to partner with UCD performing basic research that could help us solve others AM challenges



# Journey



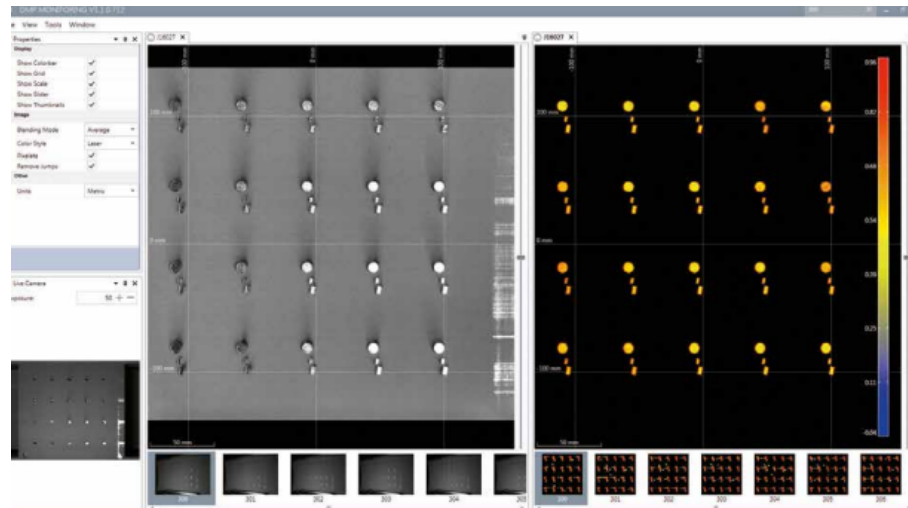
Manuel Lopez

- MS Thermal Science UPRM
- 2011-2012 AM Service Engineer **3D-System**
- 2012-2015 AM R&D Engineer **GEA**
- 2015-2018 AM Process Engineer **GE Power**
- 2018- Present R&D S&E Mechanical Engineering **SNL**
- In situ monitoring, computer modeling, and Large Size files into Step
- Contact information
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  - mlopezm@sandia.gov

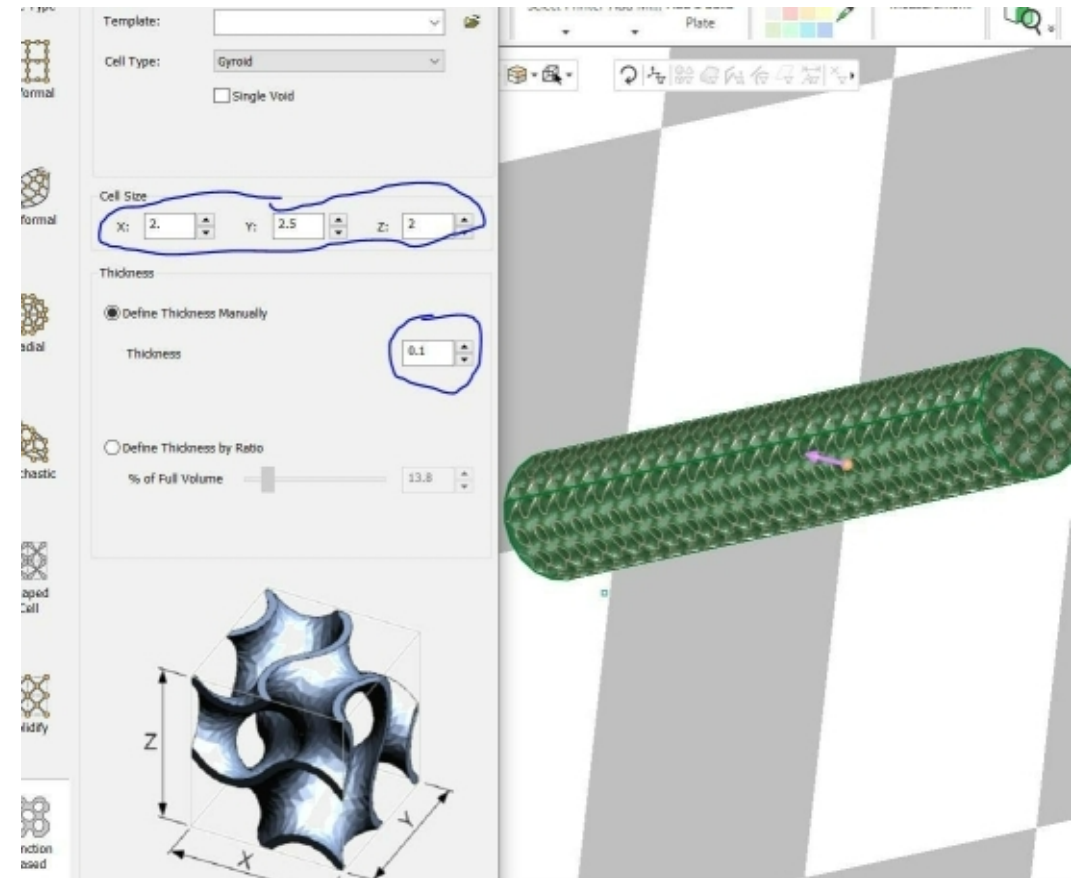


# Current work

- Lattice structurers allow to perform new design that is not possible with conventional manufacturing
  - Increment of file sizes from 100Kb to 100gb
  - Possibilities to export a STL files (100gb) into STEP?
  - Is it software or computer limitation
- Ti Stress and Distortion
  - Impact in the dimension of the part
  - How to mitigate stress
    - Modeling & Monitoring system



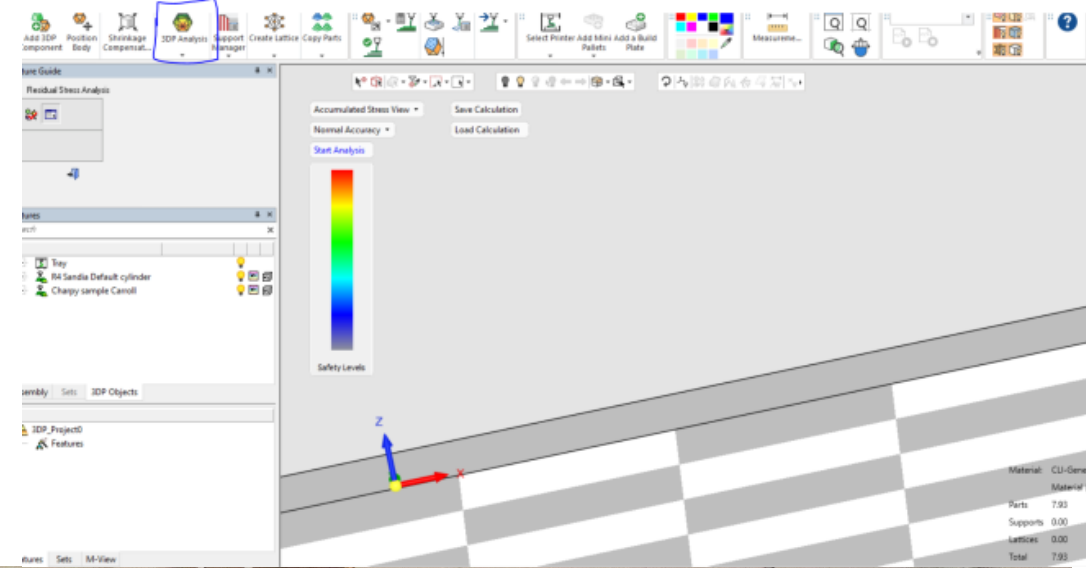
UUR





# Capabilities

- Materials
  - 304L
  - 316L
  - Ti64
  - Ti555-3





# Path forward/ Ways to Collaborate

## Summary

- Generate statistical results for Ti5-5-5-3
- Lattice large memory size into STEP format
- **How can you partner with UC Davis going forward?**
  - Tour of our facility
  - Work together some of our challenges
  - Provide feedback on AM Build and layout strategies



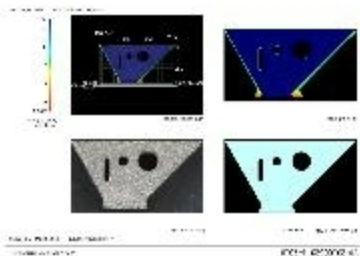
# Thank you!!!

## Q&A



# Inspection Lab

## Preliminary Results



Technology

AM Lab  
Capability  
advance

2018-  
Q2

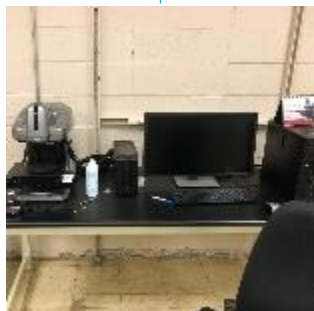
2018-  
Q3

2018-  
Q4

2019-  
Q1

2022

Infrastructure



Model: Keyence VR-300 Series



Model: Mercury Scientific  
Rev2015



Model: SEM Thermo Joel



Model: ATOS Core 135  
Blue Light Scanning  
High speed image  
measurement



Model: PROX200





## 304L & 316 Printers







## DMP 350



Key Feature	
Build Plate Dimensions	275*275*350mm
Operational O2 Levels	~3 PPM
Laser Power	500W
Alloys	Ti64 & T555-3
Software	3DExpert
Accuracy	50µm
Feature	100µm
Repeatability	X,Y,Z 20µm
Surface Finish	10-15Ra
Density	99.8%