Developing the Materials of Tomorrow – Faster, Better, Customized

Lucerne, April 10, 2018

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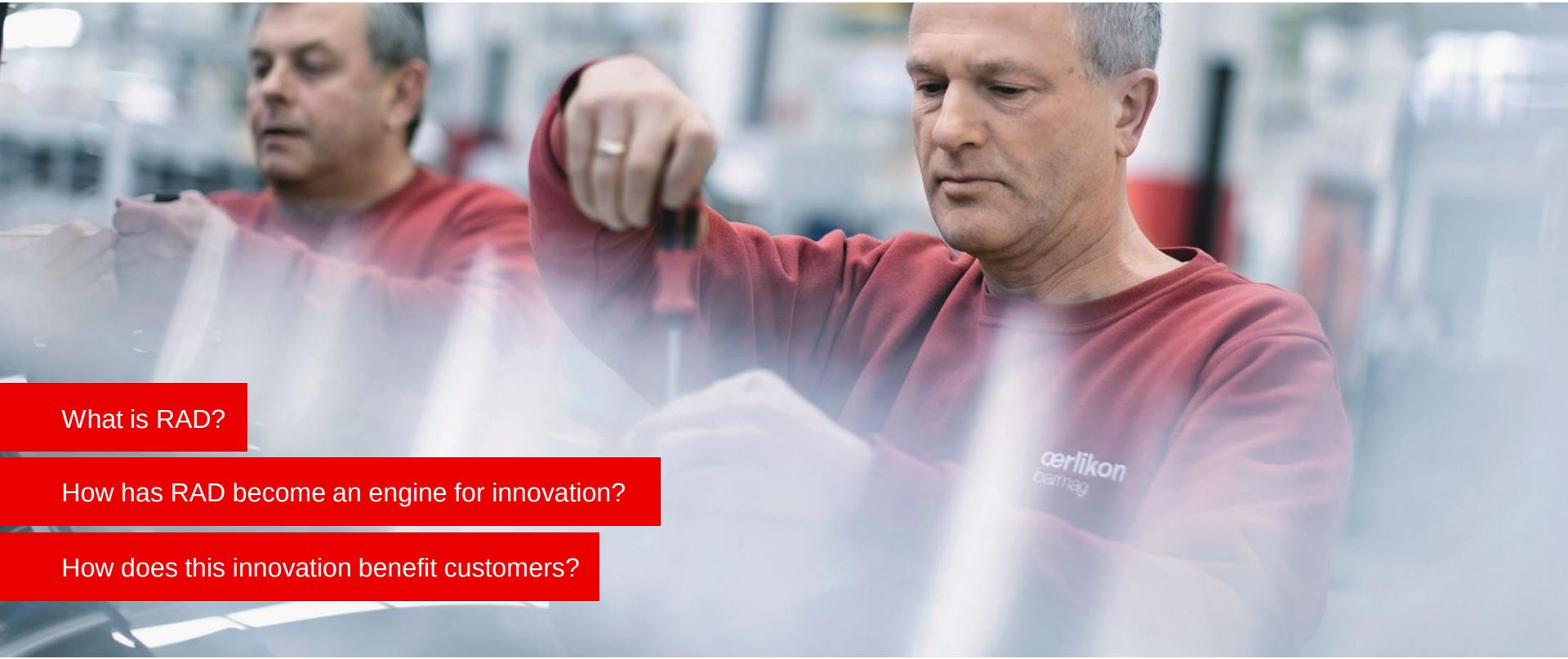
The Effect of Rapid Alloy Development on Innovation

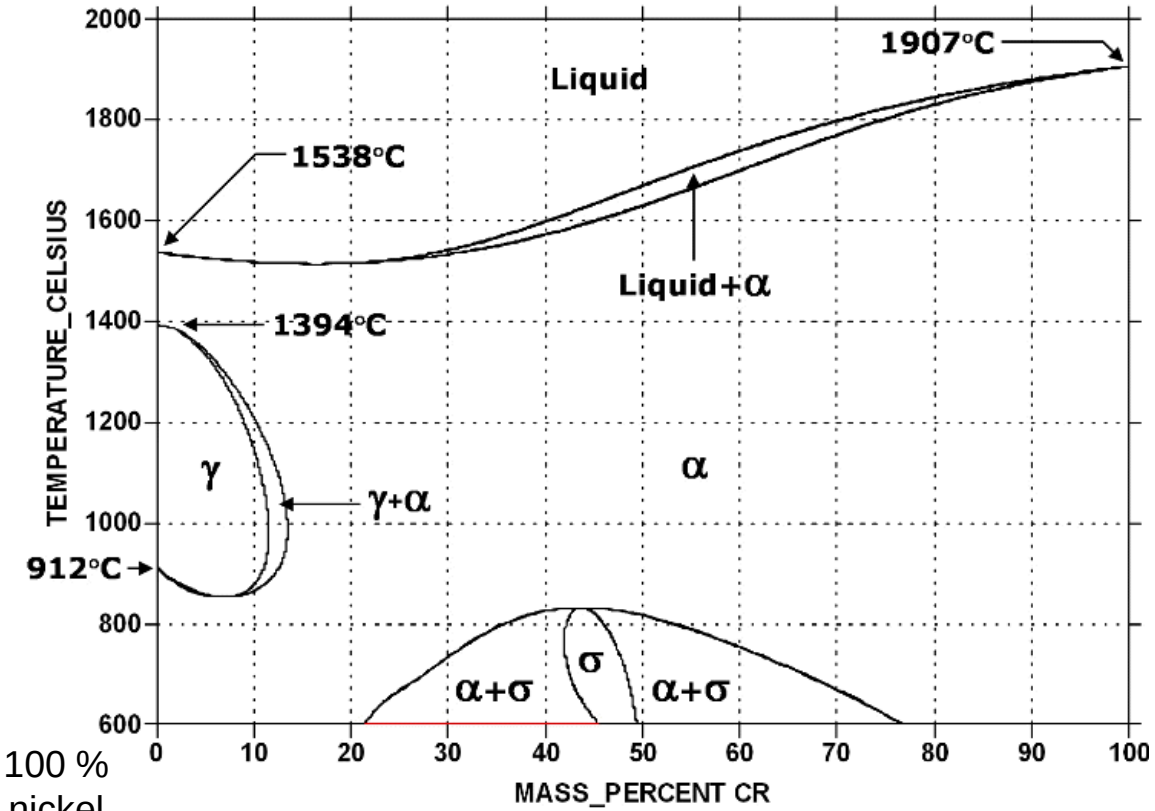


What is RAD?

How has RAD become an engine for innovation?

How does this innovation benefit customers?

The Old 2D World



100 % nickel

100 % chromium

Today‘s tools of innovation

2D

Material Science Is Not a 2D Challenge

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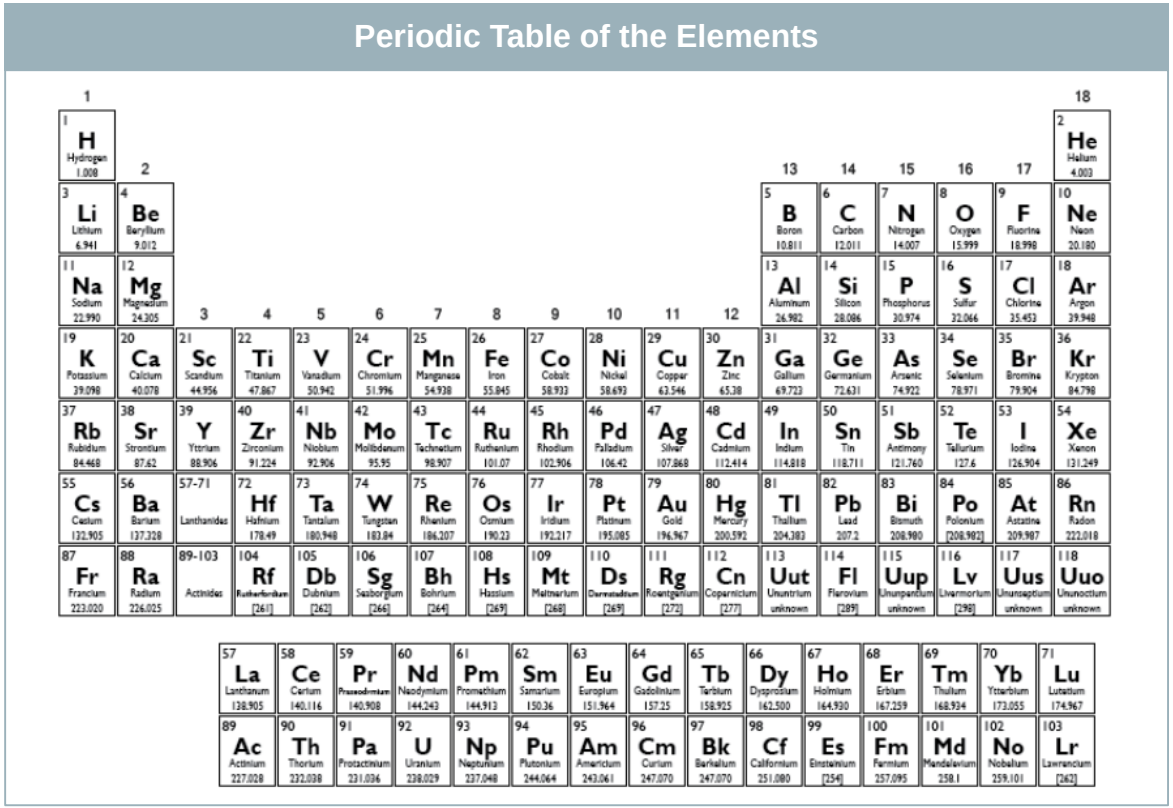
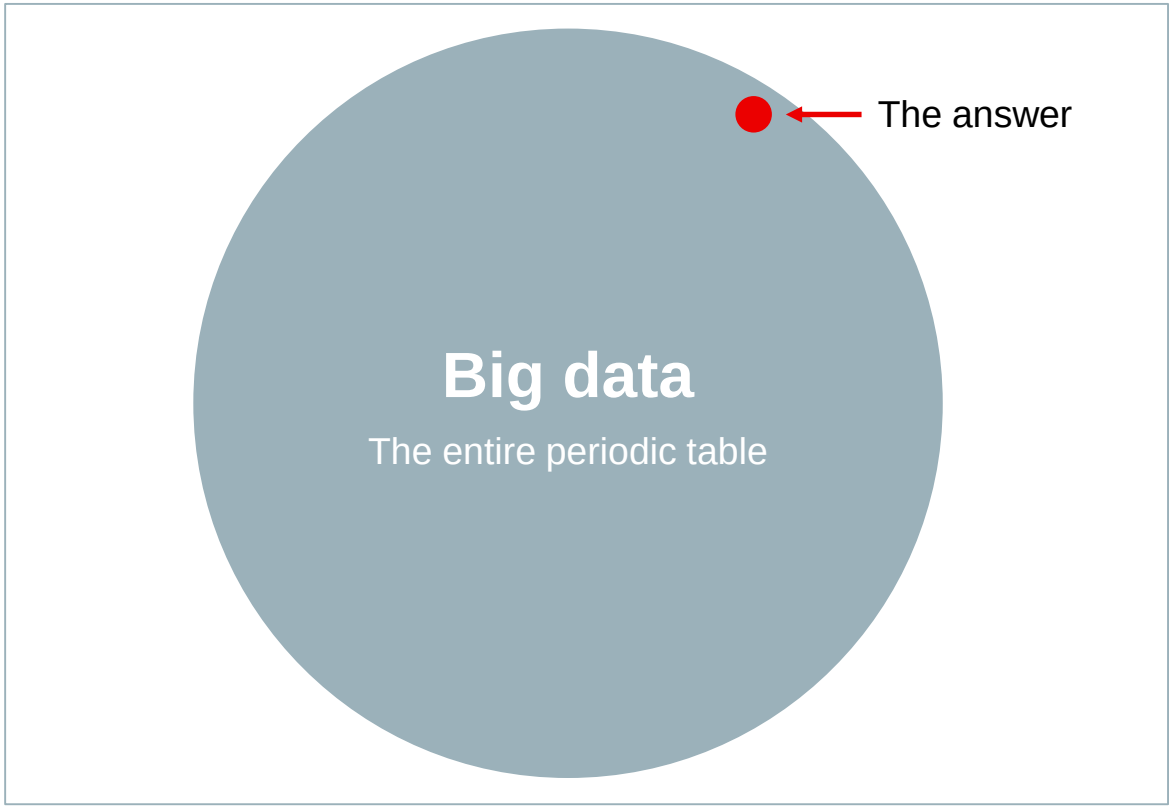
Periodic Table of the Elements



- 118 elements
- Alloys of six or more elements are common
- How can we understand the limitless possibilities?

RAD Is the Materials Embodiment of Big Data



7/24	Consider the nickel-based superalloy example
	15 000 000 alloy calculations and growing
!	3 126 440 possible alloys
	Requires RAD

Oerlikon Uses Tomorrow's Tools of Innovation

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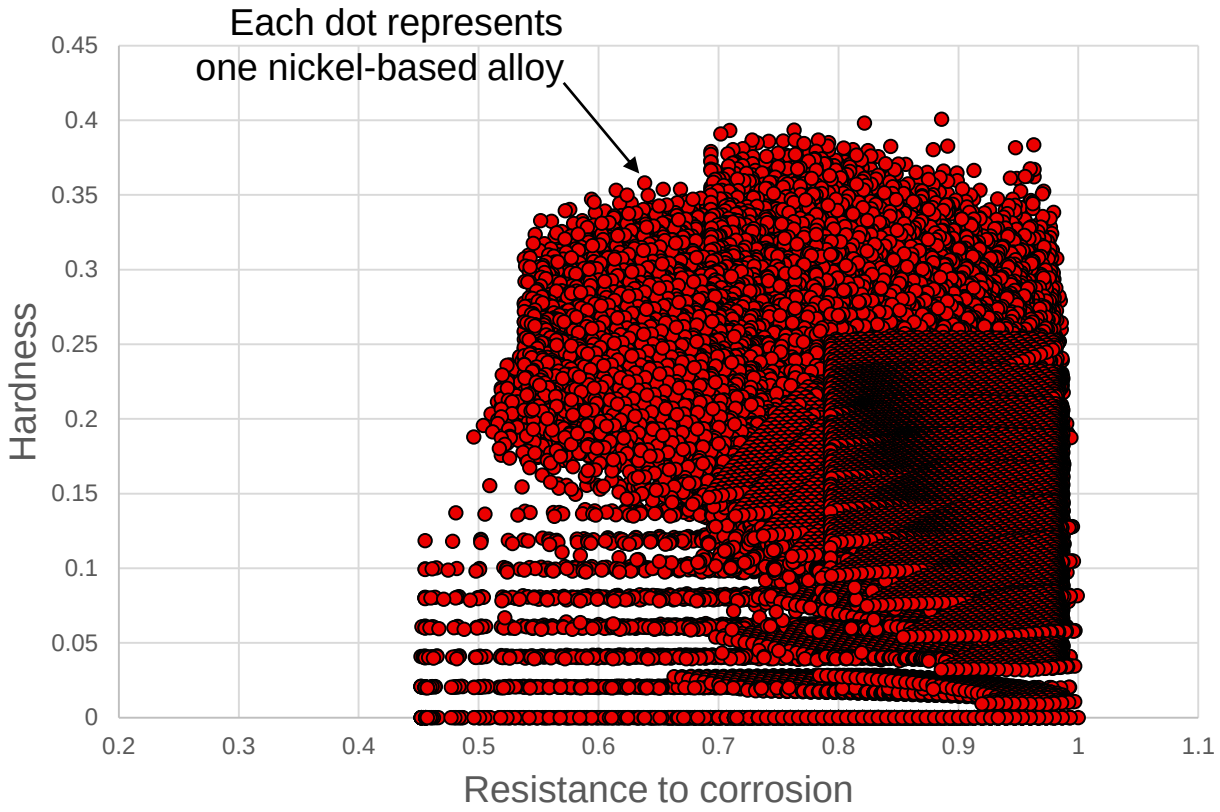
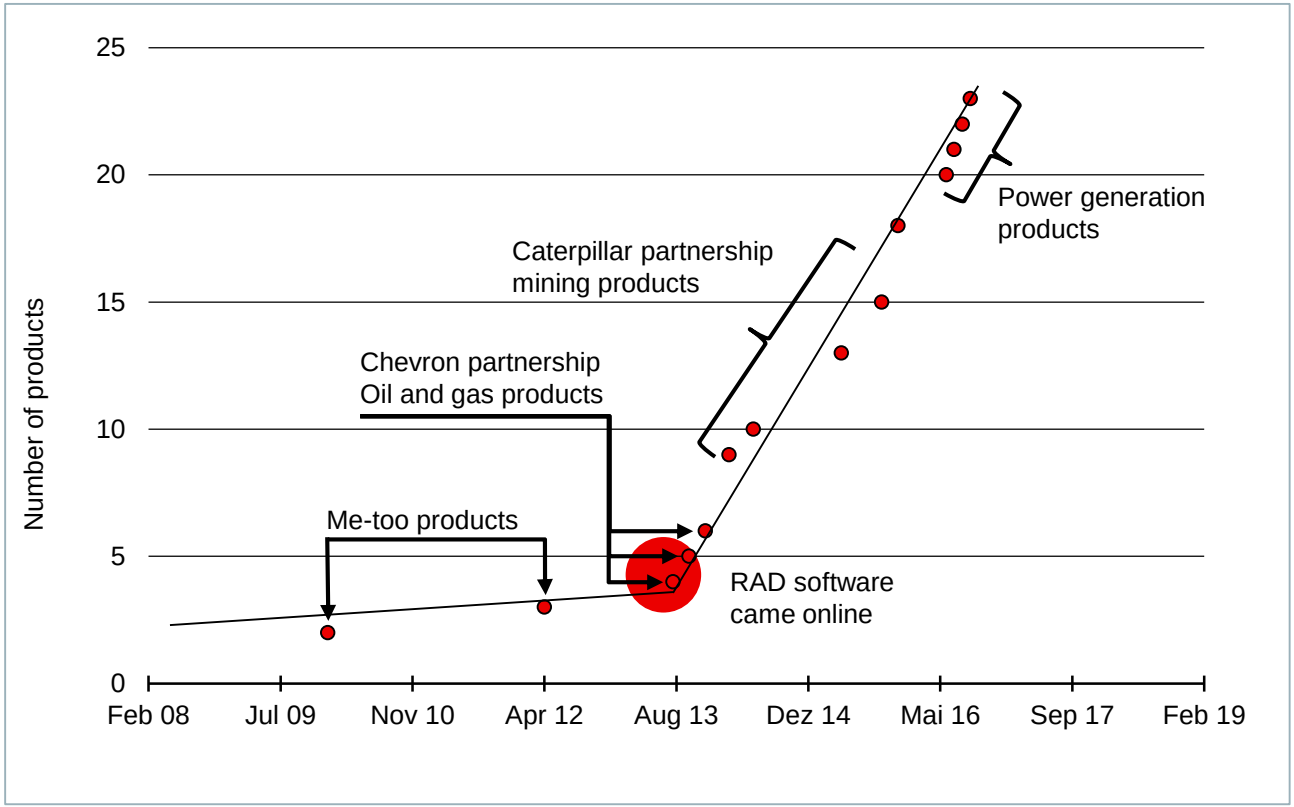


Innovating in
infinite dimensions

∞D

RAD Is an Engine for Innovation



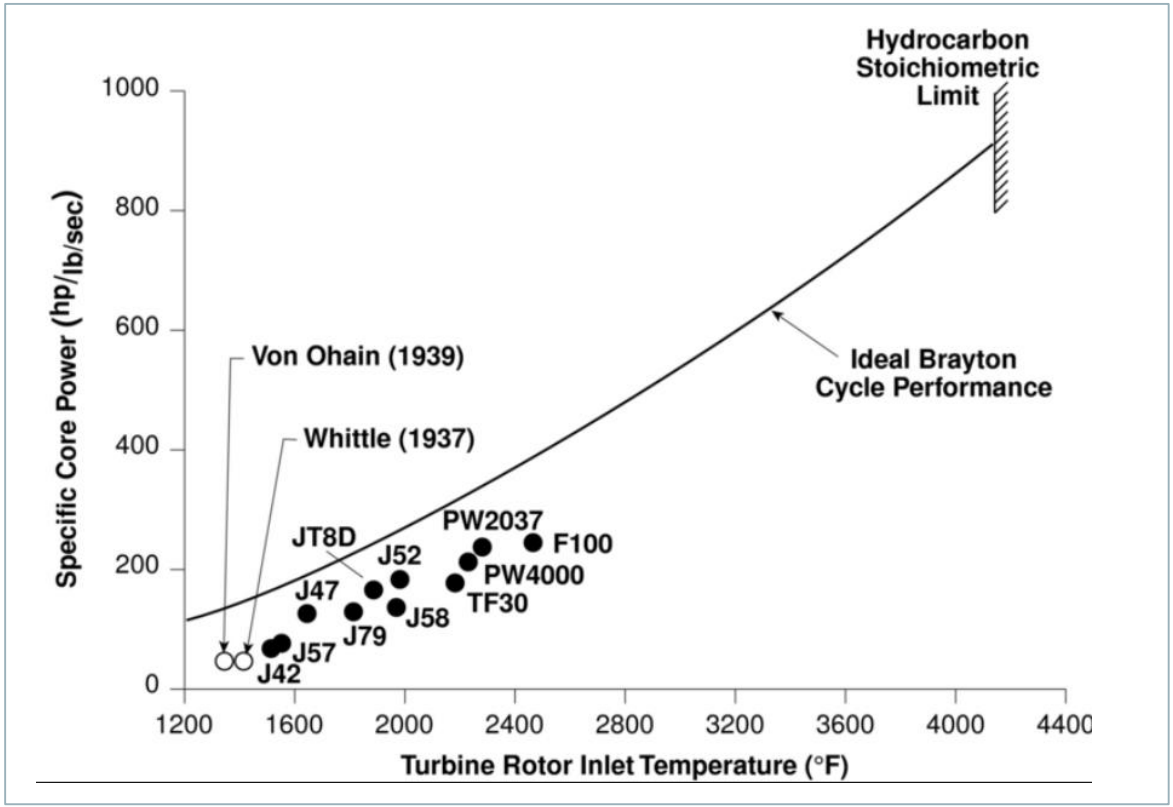
RAD software effect on innovation

5×

(~6 months concept to product)

Designing Harder Steels for Mining

Innovative Alloy Development Enhances Engine Efficiency and Power



Oerlikon coatings are a valuable component of aircraft engines

Using RAD to enhance the engines of today (superalloys)

Using RAD to enable the engines of tomorrow (CMCs)

Example: MCrAlY, M = Fe, Co, or Ni

> 3 million possible alloy variations!

Innovative Alloy Development
Will Deliver the Materials of the Future

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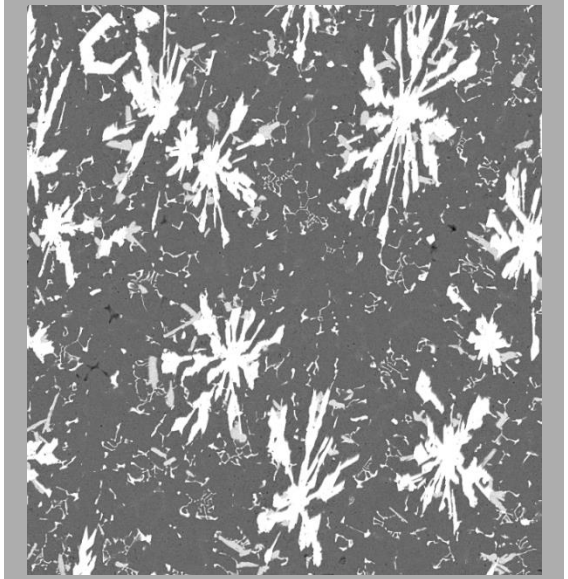
ULTRA-HIGH-TEMPERATURE PROCESSING

NEW MATERIAL SYSTEMS



ADDITIVE MANUFACTURING

Summary

★ RAD centers

Materials development is important and valuable for all industries.

Big data enables quick, smart decision-making.

RAD harnesses big data to increase the pace of innovation by 500 %.

Thank you.