

Accelerating Discovery of Novel High Entropy Alloys and Oxides with Multiple Functionalities

Research Roadmap Workshop Agenda: Tuesday Nov 12 – Wednesday Nov 13

Day 1 Morning Presentations

9:30 - 9:45 Coffee

Setting the Stage

9:45 - 9:50 Welcome and Opening Remarks

- *Dustin Gilbert, University of Tennessee Materials Science and Engineering*

9:50 - 10:20 State of the Art in High Entropy Materials

- *Easo George, UTK and ORNL*

Future Potential – Informative quick-sessions by relevant experts highlighting how the unique qualities of high-entropy materials respond to current challenges in functional materials science and present new opportunities to expand our fundamental understanding.

10:20 - 10:35 Superconductivity

- *Zac Ward, Oak Ridge National Laboratory, Materials Science and Technology*

10:35 - 10:50 Magnetism

- *Brianna Musico, University of Tennessee, Materials Science and Engineering*

10:50 - 11:05 Thermal and Thermoelectrics

- *Jon-Paul Maria, Penn State University, Materials Science and Engineering*

Agency Priorities – Brief overviews of the priorities of federal agencies and how research in functional high-entropy materials might fit within those priorities.

11:10 - 11:25 AFOSR

- *Jay Tiley, Multiscale Structural Mechanics and Prognosis*

11:25 - 11:40 ONR

- *Dave Shifler, Propulsion Materials*

11:40 - 11:55 NSF

- *Alexis Lewis, Advanced Manufacturing, Data Initiatives Director*

12:00 – 1:30 Break for Lunch

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Day 1 Afternoon Discussions

1:30 – 1:45 Coffee and discussion

Breakout Sessions: Where do we go from here? – A session dedicated to three approaches to high-entropy materials research, discovery and development, identifying the challenges and the paths forward.

1:45 - 3:00 Group 1 – Rapid Testing and Development

- *Moderator: Hugh Medal, UTK Industrial and Systems Engineering*
- *Note taker: Harry Richards, UTK*

Group 2 – Computation and Modeling

- *Moderator: Haixuan Xu, UTK Materials Science and Engineering*
- *Note taker: Candice Kinsler-Fedon, UTK*

Group 3 – Material Properties

- *Moderator: Dustin Gilbert, UTK Materials Science and Engineering*
- *Note taker: Brianna Musico, UTK*

3:00 - 3:15 Coffee Break

Group Discussion

3:15 - 3:45 Report outs from Breakout Sessions

- *Group Note Takers*

3:45 - 5:00 Scope and Scale of the Research Roadmap for High Entropy Multifunctional Materials

- *Moderator: Harry Richards, UTK Engineering Research Office*

5:00 - 5:10 Wrap-up First Day and Objectives for Day 2

- *Dustin Gilbert, UTK*

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Day 2 Sessions

8:00 – 8:15 Coffee and Discussion

On the Road

8:15 - 9:00 Review, Discuss, and Revise the Roadmap

- *Moderator: Dustin Gilbert, UTK*

9:00 - 10:15 Participant “Chalk” Talks (10 min each)

Dustin Gilbert, UTK

Jon-Paul Marie, Penn State

Kris Reyes, University of Buffalo, Materials Design and Innovation

Raj Banerjee, University of North Texas, Materials Research Facility Director

Don Brenner, North Carolina State University, Materials Science and Engineering

Peter Frazier, Cornell University, Operations Research and Information Engineering

Lisa Debeer-Schmitt, ORNL, Neutron Sciences

10:15 - 10:30 Coffee Break

10:30 - 11:45 Participant Collaboration “Chalk” Talks (up to 6 for ≈10 min each)

11:45 - 12:30 Wrap-up and Next Steps

- *Moderator: Harry Richards, UTK*

Participant Name	Organization	Area of Interest/Program	Contact
Dustin Gilbert, Chair	Tennessee	Novel Functional Materials	dagilbert@utk.edu
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Hugh Medal, Co-Chair	Tennessee	Optimization Research	hmedal@utk.edu
Jay Tiley, Co-Chair	AFOSR	Multiscale Structural Mechanisms and Prognosis	jaimie.tiley@us.af.mil
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