

**Fourteenth Annual Autumn 2021 Project Review and IAB Meeting**  
**NSF IUCRC Smart Vehicle Concepts Center <[www.SmartVehicleCenter.org](http://www.SmartVehicleCenter.org)>**  
**Hosted by The Ohio State University**  
**Location: E100 Scott Laboratory, 201 West 19<sup>th</sup> Avenue, Columbus, OH 43210**

**DAY 1: Thursday, 9 September 2021 (Room: E100)****OPEN SESSION for Registered Participants**

<b>9:30a – 11:15a</b>	<b>Registration</b>
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<b>11:15a – 1:00p</b>	<b>SESSION I: Lunch session</b>	
11:15a	Box lunches available for pick up	
11:30a	MAE Interim Chair's welcome remarks and introduction	R. Siston (OSU)
12:00p	Special keynote presentation: Propulsion research for eVTOL	T. Krantz (NASA Glenn Research Center)

<b>1:00p – 2:00p</b>	<b>SESSION II: Overview of center activities</b>	<b>Presenter(s)</b>
1:00p	Welcome and state of the center	M. Dapino (OSU)
1:30p	Overview of Industrial Advisory Board meetings and award presentations	R. Hahnen (Honda R&D)
1:45p	Group photo (weather permitting – in courtyard)	

<b>2:00p – 2:30p</b>	<b>Break (coffee and soft drinks) and student posters</b>
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<b>2:30p – 4:00p</b>	<b>SESSION III: Emerging trends in smart vehicle research - SVC research seed and REU program updates</b>	
2:30p	Aeromechanic analysis and optimization of boundary layer ingestion turbomachinery	J. P. Chen
3:00p	Self-stiffening, lightweight structural materials for energy-efficient transportation systems	H. Cho
3:15p	On the feasibility of a temperature state observer for powder bed fusion additive manufacturing	D. Hoelzle
3:30p	Analytical model for vehicle integrated photovoltaic systems	A. Contractor
3:45p	Industry perspective	H. Shah (MES, Inc.)

<b>4:15p – 5:30p</b>	<b>Student posters and informal meetings between sponsors and students/researchers</b>
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<b>5:30p</b>	<b>Adjourn:</b> Upon advance request, non-IAB members may visit the labs and interact with students and researchers
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**5:45p – 7:15p INDUSTRIAL ADVISORY BOARD (IAB) MEETING – SESSION I (dinner provided) (Room: E100)****Agenda:**

- Minutes of March 2021 meeting and action items
- Update on Outstanding Student Presentation Award
- Spring 2022 meeting dates

**7:15p – 7:45p Executive session (IAB and NSF only)****DAY 2: Friday, 10 September 2021 (Room: E100)****CLOSED SESSION for SVC Sponsors and Invited Observers only**

<b>8:00a – 8:15a</b>	<b>Breakfast (coffee and bagels) / registration</b>
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Time	Topic	Organization	Presenter(s)
<b>8:15a – 8:30a</b>	Project topics, leaders, and mentors	OSU	M. Dapino
	Project evaluations (L.I.F.E. forms)	OSU	M. Dapino
L.I.F.E. Form Website: <a href="http://iucrc.com/">http://iucrc.com/</a> Password: to be provided			

8:30a - 9:30a	Technical Session I: (FOR SVC MEMBERS ONLY)	<i>Moderated by N. Verma</i>	Presenter(s)	SVC#	Project Leader(s)	Mentor(s) (Organization)
8:30a	Ultrasonic additive manufacturing for automotive structures: UAM process modeling		G. Venkatraman (G)	#51B	M. Dapino L. Headings	J. Cartlidge (Battelle)
8:45a	UAM for structural reinforcement		L. Headings	#51C		R. Hahnlen (Honda R&D)
9:00a	UAM steel builds		N. Zhao (G)	#51D		
9:15a	Joining of metal and fiber reinforced polymers		H. Guo (G)	#51E		

9:30a	Coffee break / student posters (30 minutes)					
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10:00a-11:20a	Technical Session II: (FOR SVC MEMBERS ONLY)	<i>Moderated by G. Gourdin</i>	Presenter(s)	SVC#	Project Leader(s)	Mentor(s) (Organization)
10:00a	Magnetic gears		I. Nas (G)	#54	M. Dapino	J. Scheidler V. Asnani (NASA)
10:20a	Flexible piezoelectric sensors for vehicle applications: Air speed and direction measurement		C. Wang (G)	#57C	M. Dapino L. Headings	U. Gandhi (Toyota)
10:40a	Distributed programmable actuation platforms		S. Mukhopadhyay (G)	#60	V. Doan-Nguyen N. Verma	S. Joshi (Toyota)
11:00a	Dynamic self-reforming lithium/solid electrolyte interface for solid-state battery		M. Newman (G)	#61	V. Doan-Nguyen	C. Brooks (Honda R&D)

11:20a	Lunch break (40 minutes)					
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12:00p-1:10p	Technical Session III: (FOR SVC MEMBERS ONLY)	<i>Moderated by L. Headings</i>	Presenter(s)	SVC#	Project Leader(s)	Mentor(s) (Organization)
12:00p	Nanostructured materials for high-energy density batteries		G. Gourdin	#62	V. Doan-Nguyen	C. Brooks (Honda R&D)
12:20p	<i>New project:</i> 3D structural batteries in fiber reinforced composite panels		S. Mukhopadhyay (G) L. S. Singavarapu (U)	#61B	A. Contractor N. Verma	C. Brooks (Honda R&D) U. Gandhi P. Gilmore (Toyota)
12:40p	Smart restraint systems		V. Srinivas (G)	#63	M. Dapino	R. Hahnlen S. Malcolm (Honda R&D) S. Dershem (Autoliv)
1:00p	<i>New project:</i> Heat generation and heat dissipation analysis for EV inverters		N. Verma	#64	A. Contractor N. Verma	H. Shah (MES, Inc.)

Key: G - Graduate Student; U - Undergraduate Student

### 1:20p Closed Session Adjourns

(IAB members should remain in E100. Non-IAB members may move to labs to talk with students.)

### 1:30p - 3:00p INDUSTRIAL ADVISORY BOARD (IAB) MEETING SESSION II (in E100)

#### Agenda:

- Center operations – Marcelo Dapino
- L.I.F.E. form summaries and discussion
- Members' perspectives
- Action items and adjourn