

AFOSR Program Review Agenda

The Basic Research Initiative: “Muscular-Skeletal System Inspired Morphing Air Vehicles Using Active Materials”

***University of Michigan, Lead
Stanford University
Texas A&M University
University of British Columbia
University of California, Los Angeles
Royal Veterinary College
University of Rome***

***25 March 2019
4100 North Fairfax Drive
Arlington, VA 22203***

SPONSORED BY:



Meeting Host:

Les Lee (AFSOR)

Chair:

Daniel Inman (Univ. of Michigan), **Lead PI**

Awardees:

"(BRI'16) Avian-Inspired Multifunctional Morphing Vehicles"

PI: Daniel Inman (Univ. of Michigan)

Co-PI's:

Fu-Kuo Chang (Stanford Univ.)

Yong Chen (Univ. of California, Los Angeles)

Henry Sodano (Univ. of Michigan)

Darren Hartl (Texas A&M Univ.)

"(BRI'16) Principles of Avian Musculoskeletal Control for Multifunctional Morphing Vehicles"

PI: David Lentink (Stanford Univ.)

Co-PI: Doug Altshuler (Univ. of British Columbia)

"(BRI'16) Avian-Inspired Morphing Air Vehicles: Underpinning Biological Research"

PI: Richard Bomphrey (Royal Veterinary College)

Co-PI: James Usherwood (Royal Veterinary College)

"(BRI'16) Highly Reconfigurable, Multistable Composites with Tunable Morphing Capability"

PI: Giulia Lanzara (Univ. of Rome)

Co-PI: Walter Lacarbonara (Univ. of Rome)

"Localized and Rapid Variable Compliance Via Phase Changing Matter and Distributed Computation"

PI: Robert Shepherd (Cornell Univ.)

Co-PI: Nikolaus Correll (Univ. of Colorado)

"On-demand Stiffness Selectivity for Morphing Systems"

PI: Andres Arrieta Diaz (Purdue Univ.)

Air Force Representatives:

B.-L. ("Les") Lee (Air Force Office of Scientific Research), **PM**

Gregg Abate (Air Force Office of Scientific Research), **Co-PM**

Patrick Bradshaw (Air Force Office of Scientific Research), **Co-PM**

Jean-Luc Cambier (Air Force Office of Scientific Research) – *Invited*

Aura Gimm (Air Force Office of Scientific Research) – *Invited*

Frederick Leve (Air Force Office of Scientific Research) – *Invited*

Jay Tiley (Air Force Office of Scientific Research) – *Invited*

David Garner (European Office of Aerospace R&D), **Co-PM**

Shad Reed (European Office of Aerospace R&D), **Co-PM**

Douglas Smith (European Office of Aerospace R&D), **Co-PM**

Jeffery Baur (Air Force Research Lab - AFRL/RXCCM)

Benjamin Dickinson (Air Force Research Lab - AFRL/RWWN)

James Joo (Air Force Research Lab - AFRL/RQVS)

Gregory Reich (Air Force Research Lab - AFRL/RQVC)

AGENDA

Monday, March 25

***The 3rd Annual Review of The Basic Research Initiative:
“Muscular-Skeletal System Inspired
Morphing Air Vehicles Using Active Materials”***

<i>Time</i>	<i>Speaker</i>	<i>Title of Project</i>
08:00		<i>Registration</i>
<i>Session Chair: Pat Bradshaw (AFOSR)</i>		
08:15	Les Lee AFOSR	Welcome & Logistics
08:25	Dan Inman U Michigan	<i>Program Overview: Avian-Inspired Multifunctional Morphing Vehicles; Principles of Avian Musculoskeletal Control; Underpinning Biological Research; Highly Reconfigurable, Multistable Composites</i>
08:55	David Lentink Stanford U	Inspiration from Biological Avian Morphing: Aerodynamic Performance
09:15	Doug Altshuler U British Columbia	Inspiration from Biological Avian Morphing: Physiology and Kinematics
09:35	Jim Usherwood Richard Bompfrey Royal Veterinary College	Laboratory-Based Approaches for Bird Wing Morphing Experiments
09:55	Coffee	Break
<i>Session Chair: Jeff Baur (AFRL/RX)</i>		
10:20	Fu-Kuo Chang Stanford U	Bio-inspired Distributed Sensing
10:40	Yong Chen UCLA	Self-Adaptive Neuromorphic Circuits for Morphing Wings
11:00	Henry Sodano U Michigan	3D Printed Actuators and Sensors
11:20	Darren Hartl Texas A&M	Emulation of Avian Muscular Work Loops with Multi-Physical Actuators
11:40	Dan Inman U Michigan	Avian Inspired Morphing Surfaces
12:00	Lunch	Break
<i>Session Chair: James Joo (AFRL/RQ)</i>		
13:30	Rob Shepherd Cornell U Nikolaus Correll U Colorado	<i>(Invited)</i> Localized and Rapid Variable Compliance Via Phase Changing Matter and Distributed Computation
13:50	Giulia Lanzara Walter Lacarbonara U Rome	Highly Reconfigurable, Multistable Composites with Tunable Morphing Capability
14:10	Jeff Baur AFRL/RXCCM Ben Dickinson AFRL/RWWN	Bio-inspired Morphing Skins for Articulating Head Concepts
14:30	Greg Reich AFRL/RQVC	Bio-inspired Reconfigurable System Design via Topology Optimization

14:50	Andres Arrieta Diaz Purdue U	<i>(Invited)</i> On-demand Stiffness Selectivity for Morphing Systems
15:10	Coffee	Break
Session Chair: Greg Reich (AFRL/RQ)		
15:35		Open Discussion
16:25	Les Lee AFOSR	<i>Closing Remark</i>
16:30	Adjournment	Adjournment

MEETING WEBSITE

<https://community.apan.org/wg/afosr/w/researchareas/24597/2019-the-3rd-annual-review-for-bri-16-on-avian-inspired-multifunctional-morphing-vehicles/>

Including the information on the meeting registration, agenda, hotels and parking

MEETING SITE

Basic Research Innovation & Collaboration Center (BRICC)

4100 North Fairfax Drive, Suite 450
Arlington, VA 22203