



SecAF 2030 S&T Study

**Rodney Bowersox
TEXAS ENGINEERING EXPERIMENT STATION COLLEGE STATION**

**10/05/2018
Final Report**

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**Air Force Research Laboratory
AF Office Of Scientific Research (AFOSR)/ RTB2
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FINAL REPORT

SecAF AF 2030 S&T Forum at Texas A&M University, June 28-29

TITLE:

SecAF 2030 S&T Study

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ABSTRACT

Under the leadership of Secretary of the Air Force Dr. Heather Wilson, the US Air Force initiated a strategic planning initiative to engage academia and industry developing the funding directions to prepare for 2030 and beyond. The Texas A&M University System (TAMUS) was selected to host the Southern Region forum. A 1.5-day forum took place on June 28-29, 2018 on the Texas A&M University (TAMU) campus. The format consisted of a series of introductions, keynote lectures, and four science and technology thematic ideation sessions. The following four sessions were held: (1) Space Situational Awareness, (2) Nuclear Delivery Systems, (3) Hypersonics, Lasers, and Electromagnetics, and (4) Engineering and Military Medicine. There were nearly 400 participants in the forum from academia, industry, government and national labs. Keynote speakers included The Honorable Bill Flores (TX-17th Dist.), The Honorable Henry Cuellar (TX-28th Dist.), Mr. Norman Augustine, and Major General William Cooley. The forum was successfully executed, and the closing keynote address was provided by the Secretary of the Air Force, Dr. Heather Wilson.

Publicly Releasable

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PROJECT NARRATIVE

1. INTRODUCTION

The US Air Force initiated a strategic planning initiative to engage academia and industry developing the funding directions to prepare for 2030 and beyond. The following quote from the Air Force describes the AF2030 process:

“In 1944, Theodore von Karman envisioned a new Air Force through his study, *Toward New Horizons*. The technologies identified more than 70 years ago are the reality that keeps America safe today. In September 2017, Secretary of the U.S. Air Force Heather Wilson launched an initiative to update the Air Force's science and technology strategy. Over the course of a year, the Air Force will listen and learn from the scientific community, higher education and business professionals through a series of conversations and outreach events. We can't afford to slow down. As our adversaries close the technology gap, we need to push the boundaries of what's possible and invent the future. In order to defend America, we need your help to innovate smarter and faster. Our warfighters depend on us to keep the fight unfair and we will deliver. We can accomplish the unthinkable together.” - *US Air Force* (<https://afresearchlab.com>)

To help meet this call from Secretary Wilson, the US Air Force sponsored regional learning sessions across the United States.

“By listening to your insights, we will reimagine tomorrow for the Air Force and our world. Submit your ideas and check out our events to help us better prepare for 2030 and beyond.” - *US Air Force* (<https://afresearchlab.com>)

The Texas A&M University System (TAMUS) was selected to host the Southern Region Learning Session. This forum took place on June 28-29, 2018 on the Texas A&M University (TAMU) campus at the Hall of Champions.

2. TEXAS A&M UNIVERSITY HOSTED FORUM

2.1 FORMAT AND SUMMARY OF PRESENTATIONS

A 1.5-day forum was executed. The format consisted of a series of introductions, keynote lectures, and four Science and Technology (S&T) thematic ideation sessions. The four thematic sessions were proposed by TAMUS and approved by Air Force Research Laboratory (AFRL) subject matter experts. The agenda for the TAMUS- hosted AF2030 S&T forum is summarized in Appendix A. A list of all of the presentations is summarized in Table 1.

Table 1 Summary of Presentations

Thursday, June 28, 2018 (1:00 PM – 9:00 PM)

Welcome and Introduction

John Sharp, Chancellor, The Texas A&M University System

Major General William Cooley, Commander, AFRL

Theme Introduction – Major Brook Bentley

Q&A with Major General Cooley

Theme 1 - Space Situational Awareness, Bonnie Dunbar, Moderator

Franklin Chang-Diaz, President and CEO, Ad Astra Rocket Company

Scott Hamilton, Supervisor, Optical Communication Technology Group, MIT
Lincoln Labs

Lee Johnson, Propulsion, Thermal, and Materials Systems Group Supervisor,
Jet Propulsion Laboratory

John Junkins, TAMU Distinguished Professor, Director, Hagler Institute for
Advanced Study

Helen Reed, TAMU Aerospace Engineering Professor, Director, AggieSat Lab
Satellite Program

James Schier, Chief Architect, Space Communication and Navigation, NASA

Sherrie Zacharius, Vice President, Technology and Laboratory Operations,
The Aerospace Corporation

Theme 2 Nuclear Delivery Systems, Stephen Cambone, Moderator

Richard G. Allen, Systems Engineering Program Manager, BAE Systems, Inc.

Bryan Oliver, Senior Manager in Radiation Effects Sciences and Applications,
Sandia National Laboratories

Marvin Adams, HTRI Professor, Nuclear Engineering, Texas A&M
University

Keynote

Remarks by The Honorable Bill Flores (TX-17th Dist.)

Friday, June 29, 2018 (7:30 AM – 3:00 PM)

Welcome and Overview of Thematic Sessions

Theme Introduction – Major Brook Bentley

Q&A with Major General Cooley

Forum Logistics

Theme 3 Hypersonics, Lasers and Electromagnetics, Richard Miles, Moderator

David Carroll, President, CU Aerospace

Jonathan How, Professor of Aeronautics and Astronautics, Massachusetts Institute of Technology

Mark Kushner, George I. Haddad Professor of Engineering, University of Michigan

Thomas E. Schwartzentruber, Associate Professor and Russell J. Penrose Faculty Fellow and Director of Undergraduate Studies, University of Minnesota

David Van Wie, Mission Area Executive for the Precision Strike Mission Area, Johns Hopkins University Applied Physics Laboratory

Theme 4 Engineering and Military Medicine, Gerard Côté & Roderic Pettigrew, Moderators

Christopher Kevil, Vice Chancellor for Research, LSU Health Shreveport

Marcia O'Malley, Stanley C. Moore Professor of Mechanical Engineering, Rice University

Joseph Pancrazio, Professor of Biomedical Engineering and Associate Provost, University of Texas Dallas

Keynotes

Norman Augustine, Retired Chairman & CEO, Lockheed Martin Corporation

Introduction by The Honorable Henry Cuellar (TX-28th Dist.)

Keynote: Secretary of the Air Force Wilson

2.2 THEMATIC SESSIONS

Each thematic session was started with a 40-minute panel discussion led by Texas A&M University System moderators. The panels were comprised of leaders in the associated fields from around the United States. The purpose of each panel was to set the stage for an 80-minute ideation discussion led by Air Force contracted facilitators. Following these thematic sessions, the four sessions then met individually to down-select and develop manageable research topics which conformed to the Air Force preferred format.

In advance of the forum, the moderators and Air Force subject matter experts developed preliminary questions, which were posted on the TAMUS AF2030 website to help prepare the participants for the ideation discussions. It was stated on the website that the intent was an open forum, and that these questions were meant to inform participant preparations and should not have been considered constraints. The following thematic session were discussed in detail:

- **Space Situational Awareness.** The main goal of this theme of the forum is to explore opportunities for advancing capabilities that support the Air Force space enterprise in 2035.

Specifically, this forum seeks to identify concepts that provide capabilities to increase our space situational awareness and effectiveness. These include:

- SPACE: Congested, Contested and an Expanding “high ground”
- Space Surveillance and Communications: Detectors and sensor systems. Integration of orbits, platforms, sensors and detectors—data integration, fusion, or exploitation—and how to protect them. Development of Quantum communications. Projecting for the new “high ground”.
- Space Asset Command and Control: Data Analyses and synthesis, automation, rapid response operations
- In-Space Propulsion: LEO, MEO, GEO, and the new “High Ground”. Propulsion technologies for disaggregated small sats and for large unique “high ground” orbital platforms
- The discussions will seek to identify research opportunities and technology limitations that need to be addressed by the Air Force.

Some questions to consider as participants prepare are included below.

- What are the opportunities and constraints associated with disaggregation of assets at each orbital level?
- What is the trade space for defense dependency upon civilian cubesat/small sat data, delivery methods of the data, and timeliness of data?
- What is the feasibility for cloud data synthesis “in space”? GEO platforms?
- What are the implications for quantum communications development in contested space?
- What is the relationship between rapid response cubesat manufacturing and launch opportunities?
- Where will the space high ground be in 2030 and beyond?
- What is the trade space for propulsion? Do we need more than one strategy as the space domain grows?
- Whether small or large assets, what are the technical strategies for protecting defense assets from an exponentially growing orbital debris field? Is maneuver avoidance the first line of defense? How much lead time? Demands on propulsion system design and technologies? What is accuracy of models?
- Where are humans in the loop?
- What does “rapid response” mean for relocation of orbital assets?
- **Nuclear Delivery Systems.** The main goal of this theme of the forum is to explore opportunities for advancing capabilities that support the Air Force nuclear enterprise in 2035. Specifically, this forum seeks to identify concepts that provide capabilities to increase the survivability and lethality of our nuclear forces. Those capabilities may include operations, sustainment, and support of Air Force nuclear weapon systems available in 2035. Additionally, future operational environments will require increased weapons

operability and survivability to withstand broader delivery envelopes and induced environments. Some questions to consider as participants prepare are included below:

- What are the opportunities and impacts of increased autonomy?
- What are the opportunities and impacts of disaggregated and networked systems?
- What future concepts/technology options support more efficient ownership operations?
- Maintenance
- Security
- Transportation
- What are future concepts/technology options to support assured communications responsibilities of the Nuclear Command, Control, and Communications (NC3) system?
- How can future concepts/technologies be employed to:
 - Increase weapon/delivery platform survivability?
 - Increase versatility?
 - Increase accuracy?
 - Control effects – decrease collateral damage?
 - Mitigate/avoid defenses?
 - Increase targeting options?
- **Hypersonics, Lasers, and Electromagnetics.** The main goal of this theme of the forum is to explore opportunities for advancing capabilities that support the Air Force aeronautics enterprise in 2035. Specifically, this theme focuses on rapid impact technologies and the issues surrounding the implementation and effectiveness of those technologies. These include high speed platforms, defensive and offensive laser and electromagnetic systems, autonomy, quantum concepts and the examination of how to keep humans “in the loop” while preserving effectiveness. Some questions to consider as participants prepare are included below.
 - How robust is hypersonics for future scenarios?
 - Are manned flight platforms passé? Are they too expensive for practical consideration?
 - Will lasers dictate the future of air combat?
 - Can lasers and electromagnetics significantly change the cost to impact ratio?
 - What more can active and passive sensor technologies contribute?
 - Can air plasmas revolutionize platform capability?
 - What new electromagnetic/radar capabilities are enabled by plasma technologies?
 - What technologies integrated together provide revolutionary capabilities?
 - Will quantum-based navigation systems replace GPS?
 - What can quantum concepts contribute?
 - What technologies are required for high speed autonomous platforms to perform reliably?

- How do humans remain “in the loop” while preserving the effectiveness of these technologies?
- **Engineering and Military Medicine Theme.** The main goal of this theme of the forum is to explore opportunities for advancing capabilities that support the Air Force human performance factors enterprise in 2035. Specifically, this forum seeks to identify concepts that provide capabilities to increase the performance our airmen. Those capabilities may include enhancement and support of Air Force systems available in 2035.
 - Personalized Performance and Protection: research and technologies that will optimize individual human physical and cognitive performance across the challenging environments in which the Air Force is called to excel. A common vision is to leverage the explosion in the human sciences, including personalized health, neuroscience, biosciences and wearable devices. This area is driven by anticipated needs in personnel performance and protection for combat and other operations; cognitive performance for local and distributed decision making for command and control; personnel protection from future directed energy weapons, and has long term goals defined by Global Horizons and DOD concepts such as “Quantified Warrior”.
 - Human-Machine Teaming: technologies enabling humans and machines to seamlessly integrate into a single team where each leverages the ability of the other to achieve commander’s intent. The Air Force is able utilize autonomy to perform activities heretofore done by humans, enabling increased team performance, significant manpower cost savings and mission effectiveness. As human-human and human-machine teams and teams of teams exist across the spectrum of systems, investment in this area can be broadly applied. Human-machine teams are enablers for future aeromedical operations, e.g., en route care and transport of combat casualties.
 - Human Computer Interface: as technologies enabling humans and machines to integrate into a single team advance, it is important to design interfaces that avoid complacency while enhancing performance. Display designs, ergonomics, and other human-computer interfaces are key to humans relying on technologies when appropriate.

Some questions to consider as participants prepare are included below:

- What are the limits of the human body in the operating environments our airmen face? What can be done to push these limits further?
- What novel concepts can be applied to address human performance challenges?
- What is the next generation “point-of-care” and what gaps exist between that and the current state?
- How can the Air Force’s implementation of preventative maintenance technology – and the algorithms it uses to process its data – be used to safeguard the health and well-being of airmen?

Forum activities also supported two additional components, an invitation-only Student Futures Workshop held Wednesday, June 27, 2018, and a poster/small business enterprise (SBE) session held throughout the forum.

The Student Futures Workshop consisted of an Intensive Design Experience designed to provide input to the Air Force determine their research direction in the year 2030.

- Agenda
 - 9:00 to 10:00 Briefing by Dr. Rodney Hill to put participants in 2030
 - 10:00 to 10:15 Broke into teams to consider what 2030 will look like in four areas. These are:
 - Hypersonics and how humans will remain engaged as speeds increase
 - What will change in nuclear delivery and response systems
 - What changes are needed in Space – specifically in congestion, space propulsion, surveillance, and communication
 - Human and medicine changes to increase personal performance/protection, personalized learning, and machine to human interaction
 - Four teams formed around these topics
 - 10:15 to 12:00 Worked on selected topic
 - 12:00 to 1:00 Working lunch
 - 1:00 to 3:00 Continued work
 - 3:00 to 4:00 Each team provided a ten-minute presentation and answer questions for five minutes; all presentations included visuals
 - 4:00 Depart

Several of the technical experts from the Air Force community were present to act as mentors and technical experts in each of these fields and listened to the presentations.

The poster/SBE session had student, faculty, and small business participants from academia and industry. A list of registered participants is provided here.

Research Category	TABLE	POSTER TITLE	PRESENTERS	ORGANIZATION
Aerospace	1	Advancing numerical modeling techniques for in-space plasma propulsion devices	Hara	TAMU
	2	Computational Models for the Plasma Flows of In-Space Electric Propulsion Devices		TAMU
	3	Data Driven Situational Awareness in Space, Air and Ground Based Systems	Das	TAMU
	4	Decision-making algorithms for UAVs	Darbha	TAMU
	5	Spacecraft Occupant Protection	Currie-Gregg	TAMU
	6	Development of High-Altitude Balloon Platform for Scientific Applications	Fowler	TAMU
	7	Laminar-to-Turbulent Transition Physics of Complex Configurations	Kocian, Moyes	TAMU

	8	The Influence of Compressibility on Non-Linear spectral Energy Transfer: Effect on Hypersonic Boundary Layer Transition	Mittal	TAMU
	9	Time of Flight for Superresolution and Non-Line-of-Sight Imaging	Velten	Wisconsin
	10	Hypersonic Boundary Layer Transition (BOLT)	Kostak, Moyes, Bowersox, Reed	TAMU
	11	Hypersonic Transition	Neel, Bowersox	TAMU
	12	Hypersonic Fluid Structure Interaction	Leidy, Bowersox	TAMU
	13	Hypersonic Non-Equilibrium Turbulence	Broslawski, Bowersox	TAMU
	14	Hypersonic Shock Turbulence Interaction	McManamen, Bowersox	TAMU
Energy and Electronics	14	Optoacoustic measurement of cerebral circulatory adequacy in real time	Randall	Noninvasix, Inc.
	15	Large Scale Directed Energy	Lubin	UC Santa Barbara
	16	Harvesting Energy for 2030, living Off the Grid	Darwish	Dillard Univ
	17	Basic Mechanism of Vision	Dhankhar	TAMU
	18	Photomechanical Machines: Powering and Controlling Mechanical Actuation with Light	Shankar	U Pittsburgh
	19	Infrared (IR) optics with efficient size, weight, power, and cost	Monroe	ALLVAR Alloys
	20	Increasing service member readiness and resiliency	Polvado	CareStarter
	21	Radio Frequency Interactions of Nanomaterials, with Applications in Polymer and Ceramic Manufacturing and Printing	Patil	TAMU
	22	Structural Energy and Power	Lutkenhaus	TAMU
	23	Threat Cues Diminish Perceptions of Robotic Personhood	Holbrook	UC Merced
Materials and Manufacturing	24	Light and Tough Materials for Extreme Environments	Liang	TAMU
	25	Manufacturing Initiatives and Portfolio of Texas A&M Engineering	Bukkapatnam	TAMU
	26	Novel 2D and topological materials for optoelectronic applications	Belyanin	TAMU
	27	Rapid Therapeutics Development against Emerging Infectious Diseases and Biothreat Agents	Han	TAMU
	28	Representing Levitation Transport Technologies, LLC: Functional, Patented, multi-surface levitation platform	Brenckman	Startup Aggieland
	29	Data-driven Design and Discovery of Materials: Preparing the AFRL Workforce of Tomorrow	Shamberger	TAMU
	30	Growable Concept for an Artificial Gravity Habitat	Skelton	TAMU

	31	FFT Based Microstructural Homogenization of SMAs	Garcia	TAMU
	32	Sensing textiles	Dsouza	UNT
	33	Nano-structured Multifunctional Materials for Weight Sensitive Applications	Cai	TAMU
Additional Presentations	L1	Modelling Uncertainty and Tracking of Space Objects in Cylindrical Manifold	Ghosh	TAMU
	L2	Accelerated Discovery of Next Generation High-Temperature Shape Memory Alloys	Villarreal	TAMU
	L3	Vision and Lung: Enhanced Performance and Protection of the Warfighter	Fearling	TAMU
	L3	Vision and Lung: Enhanced Performance and Protection of the Warfighter	Arya	TAMU
	L4	PRESCIENT — Platform for the Rapid Evaluation of vaccine SuCcess using Integrated microfluidics ENabled Technology	Wippold	TAMU
	L5	System of Evaluating the Emergence or Replicating Pathogens	Huang	TAMU
	L6	Hysteresis Engineering in Caloric Effect Materials	Brown	TAMU
	L7	Local Observations of Resistance Switching Mechanisms	Clarke	TAMU
	L8	Towards provably-secure hardware designs	Rajendran	TAMU

TAMUS hosted a social Texas BBQ on Wednesday evening, June 27, as an informal get together for the core teams and subject matter experts to meet in advance of the forum. Approximately 75 attended. TAMUS also hosted a cash bar and social dinner on Thursday evening, June 28, open to all registered participants. Approximately 370 were registered to attend.

2.3 ATTENDANCE

The total number of people that registered for the AF2030forum was over 500. Of these registrants, there were 390 (78%) that attended the forum. Some demographics are summarized in Tables 2a and 2b. The names, organization, and forum registration type for the attendees are listed in Table 3 in Appendix B.

Table 2a – Attendee Demographics

AIR FORCE	ACADEMIA	STUDENTS	INDUSTRY	NAT. LABS	NASA	ARL	TAMUS/AF SUPPORT
37	145	63	60	7	10	2	66

Table 2b – Attendee Organization Demographics

GOVERNMENT LABS^a	UNIVERSITIES	INDUSTRIES	NAT. LABS	STATES
3	34	38	3	15

^aAFRL, ARL and NASA

2.4 CONCLUSIONS

Under the leadership of Secretary of the Air Force Dr. Heather Wilson, the US Air Force initiated a strategic planning initiative to engage academia and industry developing the funding directions to prepare for 2030 and beyond. The Texas A&M University System (TAMUS) was selected to host the Southern Region forum.

Overall, experience was positive from the start until the finish. Working with the AF team was a pleasure. The professionalism, flexibility, and engagement during the event were appreciated, as was their guidance that helped to shape the overall program. The originally submitted topic areas were promptly adopted by the Air Force, which allowed for rapid progress in terms of assembling the subject matter expert panels and advertising. This led to a substantial attendance, where it was repeatedly stated by the Air Force that this TAMU event was at twice as large as any of the other University Forums. The TAMUS staff worked diligently to ensure this success.

A 1.5-day forum took place on June 28-29, 2018 on the Texas A&M University (TAMU) campus, at the Hall of Champions. The format consisted of a series of introductions, keynote lectures, and four Science and Technology thematic ideation sessions. The following four thematic sessions were held: (1) Space Situational Awareness, (2) Nuclear Delivery Systems, (3) Hypersonics, Lasers, and Electromagnetics, and (4) Engineering and Military Medicine. The TAMUS hosted event attracted 390 participants. The format for the ideation sessions was as follows. The sessions began with an expert panel discussion with audience questions. This was followed by many ideation discussion sessions. The Air Force provided facilitators for the ideation and note taking during the event. The Air Force collected the participant data, as well as the ideation discussion results.

Keynote speakers included The Honorable Bill Flores (TX-17th Dist.), The Honorable Henry Cuellar (TX-28th Dist.), Mr. Norman Augustine, and Major General William Cooley. The forum was successfully executed, and the closing keynote address was provided by the Secretary of the Air Force, Dr. Heather Wilson. In addition, SecAF Wilson, Maj Gen Cooley, and Dr. Leyva toured the TAMU National Aerothermochemistry and Hypersonics Laboratory (NAL).

2.5 ACKNOWLEDGEMENT

The Air Force Research Laboratory and the Air Force Office of Scientific Research are gratefully acknowledged for supporting the Secretary of the Air Force AF2030 S&T Forum at Texas A&M University.

APPENDIX A – FORUM AGENDA

The agenda for the AF2030 S&T forum hosted by The Texas A&M University System is given below:

Thursday, June 28, 2018

12:00pm – 1:00pm: Doors open to Poster and SBE presenters for setup

1:00pm – 2:30pm: Check-in, Poster and SBE Session open

2:30pm – 3:00pm: Welcome and Introduction

John Sharp, Chancellor, The Texas A&M University System

Major General William Cooley, Commander, AFRL

3:00pm – 3:30pm: Overview of Thematic Sessions

Theme Introduction – Major Brook Bentley

Q&A with Major General Cooley

Forum Logistics

3:30pm – 3:45pm: Break

3:45pm – 5:45pm: Thematic Sessions I

Space Situational Awareness, Bonnie Dunbar, Moderator

Franklin Chang-Diaz, President and CEO, Ad Astra Rocket Company

Scott Hamilton, Supervisor, Optical Communication Technology Group, MIT
Lincoln Labs

Lee Johnson, Propulsion, Thermal, and Materials Systems Group Supervisor, Jet
Propulsion Laboratory

John Junkins, TAMU Distinguished Professor, Director, Hagler Institute for
Advanced Study

Helen Reed, TAMU Aerospace Engineering Professor, Director, AggieSat Lab
Satellite Program

James Schier, Chief Architect, Space Communication and Navigation, NASA

Sherrie Zacharius, Vice President, Technology and Laboratory Operations, The
Aerospace Corporation

Nuclear Delivery Systems, Stephen Cambone, Moderator

Richard G. Allen, Systems Engineering Program Manager, BAE Systems, Inc.

Bryan Oliver, Senior Manager in Radiation Effects Sciences and Applications,
Sandia National Laboratories

Marvin Adams, HTRI Professor, Nuclear Engineering, Texas A&M University

5:45pm – 7:15pm: Networking, Poster and SBE Session (cash bar)

7:15pm – 9:00pm: Dinner

Remarks by The Honorable Bill Flores (TX-17th Dist.)

Friday, June 29, 2018

7:30am – 8:00am: Check-in, Poster and SBE Session open

8:00am – 8:40am: Welcome and Overview of Thematic Sessions

Theme Introduction – Major Brook Bentley

Q&A with Major General Cooley

Forum Logistics

8:40am – 9:00am: Break

9:00am – 11:00am: Thematic Sessions II

Hypersonics, Lasers and Electromagnetics, Richard Miles, Moderator

David Carroll, President, CU Aerospace

Jonathan How, Professor of Aeronautics and Astronautics, Massachusetts Institute of Technology

Mark Kushner, George I. Haddad Professor of Engineering, University of Michigan

Thomas E. Schwartzenruber, Associate Professor and Russell J. Penrose Faculty Fellow and Director of Undergraduate Studies, University of Minnesota

David Van Wie, Mission Area Executive for the Precision Strike Mission Area, Johns Hopkins University Applied Physics Laboratory

Engineering and Military Medicine, Gerard Côté & Roderic Pettigrew, Moderators

Christopher Kevil, Vice Chancellor for Research, LSU Health Shreveport

Marcia O'Malley, Stanley C. Moore Professor of Mechanical Engineering, Rice University

Joseph Pancrazio, Professor of Biomedical Engineering and Associate Provost, University of Texas Dallas

11:00am – 11:15am: Break

11:15am – 12:30pm: Thematic Sessions III

Hypersonics, Lasers and Electromagnetics – All American Club North

Space Situational Awareness – All American Club South

Nuclear Delivery Systems – Heritage Lounge

Engineering and Military Medicine – Presidential Lounge

12:30pm – 1:45pm: Lunch and Keynote

Norman Augustine, Retired Chairman & CEO, Lockheed Martin Corporation

1:45pm – 2:00pm: Break

2:00pm – 2:30pm: Thematic Summaries

2:30pm – 3:00pm: Keynote/Final Remarks

Introduction by John Sharp, Chancellor, The Texas A&M University System

The Honorable Henry Cuellar (TX-28th Dist.)

Keynote: Secretary of the Air Force Wilson

APPENDIX B – LIST OF ATTENDEES

The attendees are listed in alphabetical order by last name in Table 3.

Table 3 – List of Attendees for the AF2030 S&T Forum at The Texas A&M University System, June 28-29

FIRST NAME	LAST NAME	ORGANIZATION	REGISTRATION TYPE - NAME
CHRISTIAN	ABINSAY	TEXAS A&M UNIVERSITY	STUDENT
MARVIN	ADAMS	TEXAS A&M UNIVERSITY	TAMUS/AIR FORCE SUPPORT
GIRISH	AGARWAL	TEXAS A&M UNIVERSITY	TAMUS/AIR FORCE SUPPORT
FRANK	ALBANESE	AFRL/XPO	TAMUS/AIR FORCE SUPPORT
RICHARD	ALLEN	BAE SYSTEMS INC.	INDUSTRY
CHARLES	ALTUZARRA	TEXAS A&M UNIVERSITY	ACADEMIA
ADAM	AMAR	NASA	NASA
N.K.	ANAND	TEXAS A&M UNIVERSITY	TAMUS/AIR FORCE SUPPORT
DANIIL	ANDRIENKO	TEXAS A&M UNIVERSITY	ACADEMIA
RODOLFO	ARAMAYO	ORBITUSROBOTICS	INDUSTRY
DANIEL	ARAYA	UNIVERSITY OF HOUSTON	ACADEMIA
NORMAN	AUGUSTINE	LOCKHEED MARTIN CORP. (RETIRED)	INDUSTRY
TAMARA	AVERETT-BRAUER	AFRL	TAMUS/AIR FORCE SUPPORT
PENINA	AXELRAD	CU BOULDER	ACADEMIA
CONNER	BAIRD	TEXAS A&M UNIVERSITY	STUDENT
M. KATHERINE	BANKS	TEXAS A&M UNIVERSITY	TAMUS/AIR FORCE SUPPORT
AKANKSHA	BARANWAL	TEXAS A&M UNIVERSITY	STUDENT
BERT	BARNES	RETIRED, IDAHO NATIONAL LAB	NATIONAL LAB
LAURA	BARNES	AFRL	AIR FORCE PERSONNEL

MARK	BARTEAU	TEXAS A&M UNIVERSITY	ACADEMIA
ADAM	BATCHELLOR	AIR UNIVERSITY	TAMUS/AIR FORCE SUPPORT
CARL	BEARD	LOS ALAMOS TECHNICAL ASSOC.	INDUSTRY
TUGULDUR	BEGZJAV	TEXAS A&M UNIVERSITY	STUDENT
NADER	BEHDAD	UNIVERSITY OF WISCONSIN	ACADEMIA
DAVY	BELK	MISSISSIPPI STATE UNIVERSITY	ACADEMIA
MATTHEW	BELOBRAJDIC	LANL	NATIONAL LAB
ALEXEY	BELYANIN	TEXAS A&M UNIVERSITY	ACADEMIA
BROOK	BENTLEY	AFRL	TAMUS/AIR FORCE SUPPORT
DAN	BERRIGAN	AFRL	TAMUS/AIR FORCE SUPPORT
UJWALA	BHAGAVATULA	TEXAS A&M UNIVERSITY	STUDENT
PALASH	BHARADWAJ	RICE UNIVERSITY	ACADEMIA
JOEL	BIXLER	AFRL	TAMUS/AIR FORCE SUPPORT
VAN	BLACKWOOD	AFRL	AIR FORCE PERSONNEL
VAN	BLACKWOOD	AFRL/AFOSR	AIR FORCE PERSONNEL
JENNIFER	BLAIN CHRISTEN	ASU	ACADEMIA
BRIAN	BLAKE	TEXAS A&M UNIVERSITY	TAMUS/AIR FORCE SUPPORT
AUBREY	BLOOM	TEXAS A&M UNIVERSITY	TAMUS/AIR FORCE SUPPORT
SUSAN	BLOOMFIELD	TEXAS A&M UNIVERSITY	ACADEMIA
CHARLES	BOTELLO	FRL/XPPD	AIR FORCE PERSONNEL
GREGORY	BOWEN	SURVICE ENGINEERING/DSIAC	TAMUS/AIR FORCE SUPPORT
RODNEY	BOWERSOX	TEXAS A&M UNIVERSITY	ACADEMIA
SHELLY	BRENCKMAN	STARTUP AGGIELAND	ACADEMIA
CASEY	BROSLAWSKI	TEXAS A&M UNIVERSITY	STUDENT
TIMOTHY	BROWN	TEXAS A&M UNIVERSITY	STUDENT
SATISH	BUKKAPATNAM	TEXAS A&M UNIVERSITY	ACADEMIA
JACOB	CAESAR	TEXAS A&M UNIVERSITY	STUDENT
JIZHE	CAI	TEXAS A&M UNIVERSITY	STUDENT
STEPHEN	CAIN	AFIT	AIR FORCE PERSONNEL
STEPHEN	CAMBONE	INSCER	TAMUS/AIR FORCE SUPPORT

CHARLES	CAMPBELL	NASA JOHNSON SPACE CENTER	NASA
BEN	CARPENTER	AFRL HQ	TAMUS/AIR FORCE SUPPORT
DAVID	CARROLL	CU AEROSPACE	INDUSTRY
GERALD	CARTER	TEXAS A&M UNIVERSITY – COM.	ACADEMIA
MICHAELA	CATALENA	TEXAS A&M UNIVERSITY	TAMUS/AIR FORCE SUPPORT
JUNSEOK	CHAE	ARIZONA STATE UNIVERSITY	ACADEMIA
FRANKLIN	CHANG-DIAZ	AD ASTRA ROCKET COMPANY	INDUSTRY
CHANG-HSIN	CHEN	TEXAS A&M UNIVERSITY	STUDENT
RONGXIN	CHEN	TEXAS A&M UNIVERSITY	ACADEMIA
RUEY-HUNG	CHEN	NEW MEXICO STATE UNIVERSITY	ACADEMIA
YIJUN	CHEN	TEXAS A&M UNIVERSITY	STUDENT
PAUL	CHERUKURI	RICE UNIVERSITY	ACADEMIA
SUNIL	CHIRAYATH	TEXAS A&M UNIVERSITY	ACADEMIA
TIERAH	CHORBA	DSIAC	TAMUS/AIR FORCE SUPPORT
HEIDI	CLARKE	TEXAS A&M UNIVERSITY	STUDENT
LLAYRON	CLARKSON	CLARKSON AEROSPACE CORP	INDUSTRY
JEFFREY	CLINE	DSIAC/SURVICE ENGINEERING	TAMUS/AIR FORCE SUPPORT
WARREN	COHN	TEXAS A&M UNIVERSITY	AIR FORCE PERSONNEL
JACOB	COLLINS	TEXAS A&M UNIVERSITY	STUDENT
CHRISTOPHER	COMBS	UTSI	ACADEMIA
WILLIAM	COOLEY	AFRL/CC	AIR FORCE PERSONNEL
BRETT	COOPER	SAF/AQR	AIR FORCE PERSONNEL
ZACHARY	CORDERO	RICE UNIVERSITY	ACADEMIA
GERARD	COTE	TEXAS A&M UNIVERSITY	ACADEMIA
ERIN	CRAWLEY	AFRL/AFOSR	AIR FORCE PERSONNEL
AITOR	CRUZADO	TEXAS A&M UNIVERSITY	ACADEMIA
CHRIS	CULBERT	NASA/JOHNSON SPACE CENTER	NASA
NANCY	CURRIE-GREGG	TEXAS A&M UNIVERSITY	ACADEMIA
WILLIAM	CUZICK	AFRL	AIR FORCE PERSONNEL
HAMED	DALIR	OMEGA OPTICS INC.	INDUSTRY

NILADRI	DAS	TEXAS A&M UNIVERSITY	STUDENT
SCOTT	DEAKIN	AFRL/RD	AIR FORCE PERSONNEL
VEDANG	DESHPANDE	TEXAS A&M UNIVERSITY	STUDENT
STEWART	DEVILBISS	AFRL	AIR FORCE PERSONNEL
DINESH	DHANKHAR	TEXAS A&M UNIVERSITY	STUDENT
DIEGO	DONZIS	TEXAS A&M UNIVERSITY	ACADEMIA
BONNIE	DUNBAR	TEXAS A&M UNIVERSITY	ACADEMIA
CAYLEY	DYMOND	AFRL	TAMUS/AIR FORCE SUPPORT
ALEXANDRA	EASLEY	TEXAS A&M UNIVERSITY	STUDENT
GREG	EASSON	UNIVERSITY OF MISSISSIPPI	ACADEMIA
JAMES	EDGE	CONGRESSMAN BILL FLORES	TAMUS/AIR FORCE SUPPORT
MICHAEL	EISMANN	AFRL	AIR FORCE PERSONNEL
BENJAMIN	ENGLISH	UNITED STATES MARINE CORPS	AIR FORCE PERSONNEL
BABURAJ	ERANEZHUTH	CLARKSON AEROSPACE CORPORATION	INDUSTRY
GARY	ERICKSON	PRAIRIE VIEW A&M UNIVERSITY	ACADEMIA
ANDREW	FEARING	TEXAS A&M UNIVERSITY	STUDENT
KEVIN	FELIX	BLUEPATH	INDUSTRY
JAMES	FELTY	SIGMA SCIENCE, INC.	INDUSTRY
ALLISON	FICHT	TEXAS A&M UNIVERSITY	ACADEMIA
BRIEN	FLEWELLING	EXOANALYTIC SOLUTIONS INC.	INDUSTRY
STEPHANIE	FLINT	NASA JOHNSON SPACE CENTER	NASA
BILL	FLORES	US HOUSE OF REPRESENTATIVES	TAMUS/AIR FORCE SUPPORT
ALFRED	FORZLEY	LOCKHEED MARTIN	INDUSTRY
THOMAS	FOWLER	TEXAS A&M UNIVERSITY	STUDENT
JOHN	FREEZE	KNOWLEDGE BASED SYSTEMS, INC	INDUSTRY
JONATHAN	FREUND	UNIVERSITY OF ILLINOIS UC	ACADEMIA
ANTHONY	FUNKHOUSER	SERVICENOW	INDUSTRY
RICHARD	GALLOWAY	LOS ALAMOS TECHNICAL ASSOCIATES, INC.	INDUSTRY
DIEGO	GARCIA	TEXAS A&M UNIVERSITY	STUDENT
NORMAN	GARZA	TEXAS A&M UNIVERSITY	TAMUS/AIR FORCE SUPPORT

COSTAS	GEORGHIADES	TEXAS A&M UNIVERSITY	ACADEMIA
ALEXANDROS	GERAKIS	TEXAS A&M UNIVERSITY	ACADEMIA
RIDDHI	GHOSH	TEXAS A&M UNIVERSITY	STUDENT
DYAN	GIBBENS	TRUMBULL UNMANNED	INDUSTRY
JR	GIBBENS	TRUMBULL UNMANNED	INDUSTRY
KELLY	GIDEON	TEXAS A&M UNIVERSITY	TAMUS/AIR FORCE SUPPORT
LESLEE	GILBERT	TEXAS A&M UNIVERSITY	ACADEMIA
SHARATH	GIRIMAJI	TEXAS A&M UNIVERSITY	ACADEMIA
BRAD	GLASCO	SERVICENOW	INDUSTRY
BRENDAN	GODFREY	AIR FORCE STUDIES BOARD	TAMUS/AIR FORCE SUPPORT
KEITH	GRAF	OFFICE OF THE GOVERNOR	TAMUS/AIR FORCE SUPPORT
MICAH	GREEN	TEXAS A&M UNIVERSITY	ACADEMIA
KENNETH	GRIFFING	USAF	AIR FORCE PERSONNEL
RAGHAV	GUPTA	TEXAS A&M UNIVERSITY	STUDENT
GABRIELLE	GUTIERREZ	TEXAS A&M UNIVERSITY	TAMUS/AIR FORCE SUPPORT
ADRIAN	GUZMAN	TEXAS A&M UNIVERSITY	STUDENT
FRED	HADAEGH	JET PROPULSION LABORATORY	NASA
SCOTT	HAMILTON	MIT LINCOLN LABORATORY	ACADEMIA
ARUM	HAN	TEXAS A&M UNIVERSITY	ACADEMIA
KYONG CHOL	HAN	TEXAS A&M UNIVERSITY	ACADEMIA
KENTARO	HARA	TEXAS A&M UNIVERSITY	ACADEMIA
DEREK	HARDIN	AFRL	TAMUS/AIR FORCE SUPPORT
MICHAEL	HART	UNIVERSITY OF ARIZONA	ACADEMIA
DARREN	HARTL	TEXAS A&M UNIVERSITY	ACADEMIA
TAYLOR	HARVEY	TEXAS A&M - CENTRAL TEXAS	ACADEMIA
WILLIAM	HASE	TEXAS TECH UNIVERSITY	ACADEMIA
PHILIP	HEMMER	TEXAS A&M UNIVERSITY	ACADEMIA
JAMES	HENRY	LAMAR UNIVERSITY	ACADEMIA
WILLIAM	HILBUN	SANDIA NATIONAL LABORATORIES	NATIONAL LAB
CHARLES	HILL	TEXAS A&M UNIVERSITY	ACADEMIA

KERIANNE	HOBBS	AFRL	AIR FORCE PERSONNEL
LAURYN	HOCH	LOS ALAMOS NATIONAL LAB	NATIONAL LAB
CORBETT	HOENNINGER	SIERRA NEVADA CORPORATION	INDUSTRY
COLIN	HOLBROOK	UNIVERSITY OF CALIFORNIA	ACADEMIA
KEN	HOMEYER	TRIUMPH AEROSPACE STRUCTURES	INDUSTRY
JONATHAN	HOW	MIT	ACADEMIA
SHAO-CHEN	HSU	TEXAS A&M UNIVERSITY	STUDENT
YAN	HUANG	UNIVERSITY OF NORTH TEXAS	ACADEMIA
JAMES E	HUBBARD JR	TEXAS A&M UNIVERSITY	ACADEMIA
EMILY	HUNT	WEST TEXAS A&M UNIVERSITY	ACADEMIA
LISA	HURTADO	TEXAS A&M UNIVERSITY	TAMUS/AIR FORCE SUPPORT
CARL	IVEY	TEXAS A&M UNIVERSITY	ACADEMIA
LEE	JOHNSON	NASA JPL	NASA
BRANDON	JONES	THE UNIVERSITY OF TEXAS, AUSTIN	ACADEMIA
RODNEY	JONES	BOEING	INDUSTRY
JOHN	JUNKINS	TEXAS A&M UNIVERSITY	ACADEMIA
IBRAHIM	KARAMAN	TEXAS A&M UNIVERSITY	ACADEMIA
AYDIN	KARSILAYAN	TEXAS A&M UNIVERSITY	ACADEMIA
RON	KASPI	AFRL	TAMUS/AIR FORCE SUPPORT
RON	KASPI	AFRL	TAMUS/AIR FORCE SUPPORT
WILLIAM	KEALEY	SELF/CONSULTANT (RET)	INDUSTRY
ASHLEY	KELLY	SURVICE//AFRL	TAMUS/AIR FORCE SUPPORT
LENELL	KERN	AFRL	AIR FORCE PERSONNEL
HANNAH	KERR	TEXAS A&M UNIVERSITY	TAMUS/AIR FORCE SUPPORT
CHRIS	KEVIL	LSU HEALTH SCIENCES CENTER	ACADEMIA
SEUNGCHAN	KIM	PRAIRIE VIEW A&M UNIVERSITY	ACADEMIA
SUNSOO	KIM	TEXAS A&M UNIVERSITY	STUDENT
MARIA	KING	TEXAS A&M UNIVERSITY	ACADEMIA
BRIAN	KIRSTEIN	STARTUP AGGIELAND	STUDENT
JARED	KIZER	TEXAS A&M UNIVERSITY	STUDENT

TRAVIS	KOCIAN	TEXAS A&M UNIVERSITY	ACADEMIA
MARILYN	KORHONEN	UNIVERSITY OF OKLAHOMA	ACADEMIA
HEATHER	KOSTAK	TEXAS A&M UNIVERSITY	STUDENT
ARJUN	KRISHNAMOORTHY	TEXAS A&M UNIVERSITY	STUDENT
SARA	KRZYWANSKI	LSU HEALTH SHREVEPORT	ACADEMIA
KOMAL	KUMARI	TEXAS A&M UNIVERSITY	STUDENT
VASANT	KURVARI	TEXAS A&M UNIVERSITY	STUDENT
MARK J.	KUSHNER	UNIVERSITY OF MICHIGAN	ACADEMIA
ELENA	KUZNETSOVA	TEXAS A&M UNIVERSITY	ACADEMIA
DIMITRIS	LAGOUDAS	TEXAS A&M UNIVERSITY	ACADEMIA
MAGDA	LAGOUDAS	TEXAS A&M UNIVERSITY	ACADEMIA
CINDY	LAWLEY	TEXAS A&M UNIVERSITY	ACADEMIA
NOAH	LAWRENCE	TEXAS A&M UNIVERSITY	STUDENT
SCOTT	LEGLER	ELBIT AMERICA	INDUSTRY
ANDREW	LEIDY	TEXAS A&M UNIVERSITY	STUDENT
MARK	LENOX	QT ULTRASOUND	INDUSTRY
IVETT	LEYVA	AFRL/AFOSR	AIR FORCE PERSONNEL
QUAN	LI	KENT STATE UNIVERISTY	ACADEMIA
TIAN	LI	TEXAS A&M UNIVERSITY	TAMUS/AIR FORCE SUPPORT
HONG	LIANG	TEXAS A&M UNIVERSITY	ACADEMIA
MATTHEW	LINGUIST	TEXAS A&M UNIVERSITY	TAMUS/AIR FORCE SUPPORT
MATT	LOHSTROH	TEXAS A&M UNIVERSITY	STUDENT
DIMITRIS	LOUFAKIS	TEXAS A&M UNIVERSITY	ACADEMIA
JULIE	LOVELL	711 TH HUMAN PERFORMANCE WING	AIR FORCE PERSONNEL
CHARLES	LOWRY	AIR UNIVERSITY, USAF	TAMUS/AIR FORCE SUPPORT
GRIZELDA	LOY-KRAFT	AFRL	TAMUS/AIR FORCE SUPPORT
DR KAMLESH	LULLA	NASA JOHNSON SPACE CENTER	NASA
BRYAN	LUNNEY	ODYSSEY SPACE RESEARCH	INDUSTRY
JODIE	LUTKENHAUS	TEXAS A&M UNIVERSITY	ACADEMIA
SEAN	MAHONEY	AFRL	AIR FORCE PERSONNEL

DUNCAN	MAITLAND	TEXAS A&M UNIVERSITY	ACADEMIA
HEATHER	MANLEY, PHD	TEXAS A&M UNIVERSITY	ACADEMIA
JACKSON	MAPLES	TEXAS A&M UNIVERSITY	STUDENT
CHRISTOPHER	MARCARIO	TEXAS A&M UNIVERSITY	STUDENT
MARIE	MARCHAND	ADVENTGX	INDUSTRY
PETER	MARDAHL	AFRL	AIR FORCE PERSONNEL
ALEXIS	MARRUFO	SRT	STUDENT
MARILYN	MARTELL	TEXAS A&M UNIVERSITY	TAMUS/AIR FORCE SUPPORT
CHRISTOPHER	MARTIN	LOCKHEED MARTIN	INDUSTRY
EMILY	MARTIN	AFRL	TAMUS/AIR FORCE SUPPORT
EMILY	MARTIN	AFRL / DSC	TAMUS/AIR FORCE SUPPORT
GENNY	MAUPIN	AFRL	TAMUS/AIR FORCE SUPPORT
HEDWIG	MAUPIN	U.S. ARMY RESEARCH LAB	ARL
JEREMY	MCALLISTER	ALLVAR	INDUSTRY
MICHAEL	MCCARTHY	TEXAS A&M UNIVERSITY	STUDENT
DAVID H.	MCINTYRE	TEXAS A&M UNIVERSITY	ACADEMIA
KENNETH	MCINTYRE	TEXAS A&M UNIVERSITY	TAMUS/AIR FORCE SUPPORT
BRIAN	MCJILTON	AFRL	TAMUS/AIR FORCE SUPPORT
BRIANNE	MCMANAMEN	TEXAS A&M UNIVERSITY	STUDENT
REID	MELVILLE	AFRL	TAMUS/AIR FORCE SUPPORT
MICHAEL	METZ	TEXAS A&M UNIVERSITY	INDUSTRY
RICHARD	MILES	TEXAS A&M UNIVERSITY	ACADEMIA
MICHELE	MILLER	AFRL	TAMUS/AIR FORCE SUPPORT
MITCHEL	MILLER	AFLCMC	AIR FORCE PERSONNEL
MARK	MINGES	AFRL	TAMUS/AIR FORCE SUPPORT
ANKITA	MITTAL	TEXAS A&M UNIVERSITY	ACADEMIA
JAMES	MONROE	ALLVAR	INDUSTRY
MARY BETH	MONROE	TEXAS A&M UNIVERSITY	ACADEMIA
JASON	MONSCHKE	VELO3D	INDUSTRY
VALERIE	MORAN	DETACHMENT 805	STUDENT

LEO	MORANDI	TEXAS A&M UNIVERSITY	STUDENT
JIM	MOREL	TEXAS A&M UNIVERSITY	ACADEMIA
KAITLYN	MORETZ	DSIAC	TAMUS/AIR FORCE SUPPORT
KAITLYN	MORETZ	DSIAC	TAMUS/AIR FORCE SUPPORT
TIM	MORGAN	NO. TEXAS FORESIGHT INSTITUTE	INDUSTRY
ALEXANDER	MOYES	TEXAS A&M UNIVERSITY	STUDENT
SERGIO	MUNIZ	CYFOR TECHNOLOGIES	INDUSTRY
STEPHANIE	MURPHY	MEI TECHNOLOGIES, INC.	INDUSTRY
ZACKERY	MURPHY	TEXAS A&M UNIVERSITY	STUDENT
JOSHUA	MUSICK	711 TH HUMAN PERFORMANCE WING	TAMUS/AIR FORCE SUPPORT
GURURAJ	NAIK	RICE UNIVERSITY	ACADEMIA
PAYAM	NAYERI	COLORADO SCHOOL OF MINES	ACADEMIA
IAN	NEEL	TEXAS A&M UNIVERSITY	STUDENT
ANNELLA	NELSON	LSU HEALTH SHREVEPORT	ACADEMIA
REED	NESSLER	TEXAS A&M UNIVERSITY	ACADEMIA
SIMON	NORTH	TEXAS A&M UNIVERSITY	ACADEMIA
PAUL	NORWOOD	US ARMY RESEARCH LAB - SOUTH	ARL
PAMELA	OBIOMON	PRAIRIE VIEW A&M UNIV	ACADEMIA
OZDEN	OCHOA	NASEM AFSB & TAMU	ACADEMIA
LARKIN	O'HERN	TEXAS A&M UNIVERSITY	TAMUS/AIR FORCE SUPPORT
LINDA	OLAFSEN	BAYLOR UNIVERSITY	ACADEMIA
BRYAN	OLIVER	SANDIA NATIONAL LABORATORIES	NATIONAL LAB
MARCIA	O'MALLEY	RICE UNIVERSITY	ACADEMIA
GABRIELLE	O'NEAL	SURVICE ENGINEERING	TAMUS/AIR FORCE SUPPORT
JOHN	ONTIVEROS	DSIAC	TAMUS/AIR FORCE SUPPORT
'TUNDE	OYESIDE	TEXAS A&M UNIVERSITY	STUDENT
CLAY	OZUNA	STARTUP AGGIELAND	STUDENT
JOSEPH	PANCRAZIO	UNIVERSITY OF TEXAS AT DALLAS	ACADEMIA
JOHN	PAPPAS	TEXAS A&M UNIVERSITY	ACADEMIA
SUNGGOOK	PARK	LOUISIANA STATE UNIVERSITY	ACADEMIA

ANISH	PATEL	TEXAS A&M UNIVERSITY	STUDENT
NUTAN	PATIL	TEXAS A&M UNIVERSITY	STUDENT
KENNETH	PEDDICORD	TEXAS A&M UNIVERSITY	ACADEMIA
RODERIC	PETTIGREW	TEXAS A&M UNIVERSITY	ACADEMIA
CHARLES	PHILLIPS	SPACEFLIGHT RESEARCH, LLC	INDUSTRY
JULIA	PIERKO	TEXAS A&M UNIVERSITY	TAMUS/AIR FORCE SUPPORT
JULIAN	PIERRE	CLARKSON AEROSPACE CORP	INDUSTRY
ALBERTO	PIMPINELLI	RICE UNIVERSITY	ACADEMIA
ANTHONY	POLITO	AFRL	TAMUS/AIR FORCE SUPPORT
ALEXEI	POLUDNENKO	TEXAS A&M UNIVERSITY	ACADEMIA
GREGORY	POTTS	711 HPW RHD	TAMUS/AIR FORCE SUPPORT
GREGORY	POTTS	711 HPW RHD	TAMUS/AIR FORCE SUPPORT
JOSE	QUINTANA	ADVENT GX	INDUSTRY
DANIEL	RAGSDALE	TEXAS A&M UNIVERSITY	ACADEMIA
JEAN	RAGUSA	TEXAS A&M UNIVERSITY	ACADEMIA
JEYAVIJAYAN	RAJENDRAN	TEXAS A&M UNIVERSITY	ACADEMIA
NAVID	RAJIL	TEXAS A&M UNIVERSITY	STUDENT
GRAHAM	RANDALL	NONINVASIX, INC.	INDUSTRY
DURAIWAMY	RAVICHANDRAN	TEXAS BIOCHEMICALS INC	INDUSTRY
RAM	RAY	PRAIRIE VIEW A&M UNIVERSITY	ACADEMIA
NARASIMHA	REDDY	TEXAS A&M UNIVERSITY	ACADEMIA
HELEN	REED	TEXAS A&M UNIVERSITY	ACADEMIA
ZHIFENG	REN	UNIVERSITY OF HOUSTON	ACADEMIA
MIKE	REYNOLDS	AFRL/711HPW	AIR FORCE PERSONNEL
CARLOS	RIBERA	STARTUP AGGIELAND	STUDENT
VALERIE	ROBERTS	JACOBS	INDUSTRY
SEAN	ROBINSON	SIGMA SCIENCE	INDUSTRY
BRET	ROGERS	AFRL	AIR FORCE PERSONNEL
JONATHAN	ROGERS	NASA JOHNSON SPACE CENTER	NASA
ANDREW	ROSS	TEXAS A&M UNIVERSITY	ACADEMIA

AJIT	ROY	AFRL	AIR FORCE PERSONNEL
SAMIT	ROY	UNIVERSITY OF ALABAMA	ACADEMIA
DR. CHAD	RUMCHIK	AFRL	AIR FORCE PERSONNEL
JOHN	RUSSELL	AFRL	AIR FORCE PERSONNEL
PREMKUMAR	SAGANTI	PRAIRIE VIEW A&M UNIVERSITY	ACADEMIA
RUPALI	SAHU	TEXAS A&M UNIVERSITY	STUDENT
MERRI	SANCHEZ	AEROSPACE CORP	INDUSTRY
JAMES	SCHIER	NASA	NASA
WOLFGANG	SCHLEICH	ULM UNIVERSITY	ACADEMIA
NICHOLAS	SCHMIDT	AFRL	AIR FORCE PERSONNEL
HANS	SCHUESSLER	TEXAS A&M UNIVERSITY	ACADEMIA
TOM	SCHWARTZENTRUBER	UNIVERSITY OF MINNESOTA	ACADEMIA
CHRIS	SCOTTI	TEXAS A&M UNIVERSITY	ACADEMIA
LENAE	SCROGGINS	TEXAS A&M UNIVERSITY	TAMUS/AIR FORCE SUPPORT
MARLAN	SCULLY	TEXAS A&M UNIVERSITY	ACADEMIA
CHRIS	SHANK	VAN SCOYOC ASSOCIATES	INDUSTRY
JOHN	SHARP	TEXAS A&M UNIVERSITY	TAMUS/AIR FORCE SUPPORT
MATTHEW	SHELDON	TEXAS A&M UNIVERSITY	ACADEMIA
ANTON	SHUTOV	TEXAS A&M UNIVERSITY	STUDENT
MARIIA	SHUTOVA	TEXAS A&M UNIVERSITY	STUDENT
ROBERT	SKELTON	TEXAS A&M UNIVERSITY	ACADEMIA
ELIZABETH	SLADECEK	TEXAS A&M UNIVERSITY	INDUSTRY
CAROL	SMIDTS	THE OHIO STATE UNIVERSITY	ACADEMIA
ANDREW	SMITH	TEXAS A&M UNIVERSITY	STUDENT
DENNIS	SMITH	MISSISSIPPI STATE UNIVERSITY	ACADEMIA
LAVERNE	SMITH	CLARKSON AEROSPACE CORP	INDUSTRY
ALEXEI	SOKOLOV	TEXAS A&M UNIVERSITY	ACADEMIA
MATTHEW	SOTEBIER	TEXAS A&M UNIVERSITY	STUDENT
SIVAGURU	SRITHARAN	AFIT	AIR FORCE PERSONNEL
BETH	STANLEY	TEXAS A&M UNIVERSITY	TAMUS/AIR FORCE SUPPORT

JAIME	STEARNS	AFRL	AIR FORCE PERSONNEL
ANATOLY	SVIDZINSKY	TEXAS A&M UNIVERSITY	ACADEMIA
VENKATA	TADIPARTHI	TEXAS A&M UNIVERSITY	STUDENT
ROBERT	THOMAS	AFRL	AIR FORCE PERSONNEL
NATHAN	TICHENOR	TEXAS A&M UNIVERSITY	ACADEMIA
CAGATAY	TOKGOZ	LAMAR UNIVERSITY	ACADEMIA
JOSEPH	TOMPKINS	AFRL	AIR FORCE PERSONNEL
JOSEPH	TOMPKINS	AFRL/RV	AIR FORCE PERSONNEL
GILBERT	TORRES	SIGMA SCIENCE INC.	INDUSTRY
CAMERON	TREECE	TEXAS A&M UNIVERSITY	STUDENT
ALBINA	TROPINA	TEXAS A&M UNIVERSITY	ACADEMIA
AARON	TROTT	INVOCON, INC.	INDUSTRY
ANDREW	TUCKER	CHANDAH SPACE TECHNOLOGIES	INDUSTRY
KELLY	TUCKER	SAF/AQR	AIR FORCE PERSONNEL
VICTOR	UGAZ	TEXAS A&M UNIVERSITY	ACADEMIA
JOHN	VALASEK	TEXAS A&M UNIVERSITY	ACADEMIA
DAVID	VAN WIE	JOHNS HOPKINS APL	ACADEMIA
ANIRUDDH	VASHISTH	TEXAS A&M UNIVERSITY	ACADEMIA
AJAY	VERMA	KNOWLEDGE BASED SYSTEMS, INC.	INDUSTRY
RUBEN	VILLARREAL	TEXAS A&M UNIVERSITY	STUDENT
VINAYAK	VINAYAK	TEXAS A&M UNIVERSITY	ACADEMIA
GARY	VIVIANI	BAE SYSTEMS	INDUSTRY
ANDREY	VOEVODIN	UNIVERSITY OF NORTH TEXAS	ACADEMIA
LOUISE	VORSTER	VITLS INC	INDUSTRY
WERNER	VORSTER	VITLS INC.	INDUSTRY
SAMUEL	WALD	NANORACKS	INDUSTRY
MELISSA	WALDEN	TEXAS A&M UNIVERSITY	TAMUS/AIR FORCE SUPPORT
CINDY	WALL	TEXAS A&M UNIVERSITY	TAMUS/AIR FORCE SUPPORT
JIM	WALL	TEXAS A&M UNIVERSITY	ACADEMIA
CHARLES	WALLACE	TEXAS A&M UNIVERSITY	STUDENT

KAI	WANG	TEXAS A&M UNIVERSITY	TAMUS/AIR FORCE SUPPORT
LING	WANG	TEXAS A&M UNIVERSITY	ACADEMIA
YONG	WANG	DAKOTA STATE UNIVERSITY	ACADEMIA
JOAN	WARD	DSIAC	TAMUS/AIR FORCE SUPPORT
ANNA	WEEKS	AFRL/RIGB	TAMUS/AIR FORCE SUPPORT
R. BRUCE	WEISMAN	RICE UNIVERSITY	ACADEMIA
RICHARD	WELLE	THE AEROSPACE CORPORATION	INDUSTRY
MARK	WELSH	TEXAS A&M UNIVERSITY	ACADEMIA
TED	WELSH	DSIAC	INDUSTRY
CODY	WELU	DAKOTA STATE UNIVERSITY	ACADEMIA
MARK	WEYLAND	NASA	NASA
JOHN	WHITCOMB	TEXAS A&M UNIVERSITY	ACADEMIA
EDWARD	WHITE	TEXAS A&M UNIVERSITY	ACADEMIA
JOHN	WIEST	UNIVERSITY OF ALABAMA	ACADEMIA
MATTHEW	WILKE	CORPS OF CADETS	AIR FORCE PERSONNEL
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RICHARD	WILKINS	PRAIRIE VIEW A&M UNIVERSITY	ACADEMIA
ANDREW	WILLIAMS	AFRL	AIR FORCE PERSONNEL
SELINA	WILLIAMS	AFRL/AFOSR	TAMUS/AIR FORCE SUPPORT
MICHAEL	WIPPERMAN	U ARL	TAMUS/AIR FORCE SUPPORT
JOSÉ	WIPPOLD	TEXAS A&M UNIVERSITY	STUDENT
ZI JING	WONG	TEXAS A&M UNIVERSITY	ACADEMIA
CLIVE	WOODS	UNIVERSITY OF SOUTH ALABAMA	ACADEMIA
GREGORY	WORKMAN	TEXAS A&M UNIVERSITY	STUDENT
KILEY	WREN	TEXAS A&M UNIVERSITY	ACADEMIA
VICTORIA	WRIGHT	TEXAS A&M UNIVERSITY	STUDENT
YUE	WU	TEXAS A&M UNIVERSITY	ACADEMIA
CRAIG	WUEST	LAWRENCE LIVERMORE NAT. LAB	NATIONAL LAB
XIAOCHUAN	XU	OMEGA OPTICS INC.	INDUSTRY
YU	YAO	ARIZONA SATE UNIVERSITY	ACADEMIA

SHERRY	YENNELLO	TEXAS A&M UNIVERSITY	ACADEMIA
ZHENHUAN	YI	TEXAS A&M UNIVERSITY	ACADEMIA
KIMBERLY	YODER	AFRL/PK	AIR FORCE PERSONNEL
DAVID	YOUNG	TRIUMPH AEROSPACE STRUCTURES	INDUSTRY
CHOONGHO	YU	TEXAS A&M UNIVERSITY	ACADEMIA
SHERRIE	ZACHARIUS	THE AEROSPACE CORPORATION	INDUSTRY
JOSÉ	ZAGLUL	AD ASTRA ROCKET COMPANY	INDUSTRY
LIDA	ZHANG	TEXAS A&M UNIVERSITY	TAMUS/AIR FORCE SUPPORT
WEIHUAN	ZHAO	UNIVERSITY OF NORTH TEXAS	ACADEMIA
XINGCHEN	ZHAO	TEXAS A&M UNIVERSITY	STUDENT
WILLIAM	ZORTMAN	SANDIA NATIONAL LABORATORIES	NATIONAL LAB

AFOSR Deliverables Submission Survey

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1.

Report Type

Final Report

Primary Contact Email

Contact email if there is a problem with the report.

bowersox@tamu.edu

Primary Contact Phone Number

Contact phone number if there is a problem with the report

(979)845-4184

Organization / Institution name

Texas A&M University/TEES

Grant/Contract Title

The full title of the funded effort.

SecAF AF 2030 S&T Forum at Texas A&M University, June 28-29

Grant/Contract Number

AFOSR assigned control number. It must begin with "FA9550" or "F49620" or "FA2386".

FA9550-18-1-0188

Principal Investigator Name

The full name of the principal investigator on the grant or contract.

Rodney D. W. Bowersox

Program Officer

The AFOSR Program Officer currently assigned to the award

MAJ Anthony B. Polito

Reporting Period Start Date

04/01/2018

Reporting Period End Date

09/30/2018

Abstract

Under the leadership of Secretary of the Air Force Dr. Heather Wilson, the US Air Force initiated a strategic planning initiative to engage academia and industry developing the funding directions to prepare for 2030 and beyond. The Texas A&M University System (TAMUS) was selected to host the Southern Region forum. A 1.5-day forum took place on June 28-29, 2018 on the Texas A&M University (TAMU) campus. The format consisted of a series of introductions, keynote lectures, and four science and technology thematic ideation sessions. The following four sessions were held: (1) Space Situational Awareness, (2) Nuclear Delivery Systems, (3) Hypersonics, Lasers, and Electromagnetics, and (4) Engineering and Military Medicine. There were nearly 400 participants in the forum from academia, industry, government and national labs. Keynote speakers included The Honorable Bill Flores (TX-17th Dist.), The Honorable Henry Cuellar (TX-28th Dist.), Mr. Norman Augustine, and Major General William Cooley. The forum was successfully executed, and the closing keynote address was provided by the Secretary of the Air Force, Dr. Heather Wilson.

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Please describe and include any notable dates

Do you plan to pursue a claim for personal or organizational intellectual property?

Changes in research objectives (if any):

None

Change in AFOSR Program Officer, if any:

None

Extensions granted or milestones slipped, if any:

None

AFOSR LRIR Number

LRIR Title

Reporting Period

Laboratory Task Manager

Program Officer

Research Objectives

Technical Summary

Funding Summary by Cost Category (by FY, \$K)

	Starting FY	FY+1	FY+2
Salary			
Equipment/Facilities			
Supplies			
Total			

Report Document

Report Document - Text Analysis

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Appendix Documents

2. Thank You

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