

UPDATE ON FOUR RECENT EVENTS WHERE THE CYBER TEAM AREA WAS VISITED

(These four events resulted in widespread, positive visibility for the Cadet Cyber Competition Team and the **Class of 1968**.)

The first event – The visit from the Colorado Congressional Delegation – Aug 11th, 2021

Garry Dudley & Mark Baisley, Colorado State Representative, arranged for the Colorado State Delegation below to visit DF.

Visitors

Colorado State Senator Leroy Garcia, Jr. (D-3)

President of the Senate; Committee Assignments - Executive Committee of the Legislative Council
Chair, Legislative Council Chair

Colorado State Representative Mark Baisley (R-39)

Committee Assignments – Appropriations, Health & Insurance, Education, Joint Technology
Committee

Colorado State Representative Colin Larson (R-22)

Committee Assignments - Ranking Member Education Committee, Legislative Audit Committee,
Legislative Interim Committee on School Finances, Public & Behavioral Health & Human Services

Colorado State Representative Don Valdez (D-62)

Chairman Aerospace Committee

Ms. Antoinette Harris

Legislative Aide to State Representative Mark Baisley

Purpose

To visit the various cyber centers/areas at USAFA to gather current information on integrating cyber offensive and defensive activities; understanding the criticality of cyber to space operations; developing future Air Force and Space Force officers with critical cyber skills and knowledge and how to solve pressing problems in a high-tech environment; and, how cyber warfare is crucial to future conflict.

Added benefits: Team building on a trip centered on bipartisan fact-gathering in support of keeping the Space Force command structure in Colorado Springs and a better understanding of cyber threats and USAF/USAFA's role in this critical arena.

We started the visit with lunch at the Golf Course Club House hosted by BG Letendre, Dean of Faculty. We then proceeded to the Astro Lab to discuss FalconSAT and Space Ops, followed by a visit to the Multi-Domain Lab to discuss Multi-Domain Lab and the vision for curricula. Next came Cyber City and

Cyber Competition Team Area. **Note the picture of the delegation under the '68 Cyber Plaque!** We finished the tour by gathering in the AF CyberWorx area in the library to discuss AF CyberWorx, the Institute for Future Conflict, and the Madera Cyber Innovation Center.

Cyber Innovation Center. Please see the included pictures.





The second event – A visit by Ambassador Craig Stapleton and his wife, Debbie – 18 September

(The following notes were extracted (and modified) from the report sent to the Dean of Faculty by the Department of Computer and Cyber Sciences)

Charlie Holland was the driving force ensuring Ambassador Stapleton visited the cyber range on his recent visit. Thanks, Charlie!

On 18 Sept, Ambassador Craig Stapleton, Gen (Ret) Charles Holland ('68), Lt Col (Ret) Garry Dudley ('68) (and Tina!) and Lt Col (Ret) Carl Janssen ('68) toured DFCS' Cyber City and the Cyber Range. In the Cyber City lab, these distinguished visitors learned about the artificially intelligent flying drones that cadets in the Comp Sci 472 course get to the program, in addition to learning about the hack-ability of Cyber City itself and the Cyber Sci 435 course where Cyber City is featured. The visitors were impressed by the mere existence of USAFA's computer science, cyber science, and data science academic programs, mainly because of the cadets' exposure to artificial intelligence, security of cyber-physical systems, and software that drives it all. In the Cyber Range, the Ambassador and visitors got to see the Cadet Cyber Competition Team participating live in the President's Cup Cybersecurity Competition. Gen Holland spoke with the students about the importance of cyber in the current and future fight. The cadets sincerely appreciated those remarks, mainly because they came from a true warrior—the former USSOCOM Commander! Gen Holland also expressed the hope he, his class ('68), and the DoD have in people like these cadets, sharpening their technological warfare intuition through training and friendly

competition. (Note: The Class of 1968 generously donated their class gift to endow the Cadet Cyber Competition Team a couple of years ago, and that gift continues to grow).



The third event – Visit from Honeywell Quantum Solutions and Cambridge Quantum Computing – Oct 13, 2021
(Now known as Quantinuum, Ltd.)

Visitors

Councilman Randy Helms, Colonel USAF (Ret) (District 2, Colorado Springs) [Lunch only]

Lt Col (Ret) Garry Dudley [USAFA Class of '68]

Amy Berg, Research Event and Visit Coordinator

1. Slipglass, Inc

Mark Baisley, President & CEO of Slipglass, Inc.

Drew Goodyear, Scott Shires

2. Honeywell Quantum Solutions (HQS)

Tony Uttley, President

Jeff Miller, Chief Information Officer

Steve Hadden, Chief Business Officer

Justin Ging, Chief Commercial Officer

3. Cambridge Quantum Computing (CQC)

Tom Benjamin, CQC's president for North America operations

Jimmac Lofton, Business Development

4. CUbit Quantum Initiative (CU Boulder)

5. USAF Academy CIO Office [A6] [Honeywell presentation only]

Mike Andrews, Paul Rumpler

DF Staff and POCs for visit

The following agencies (and associated POCs) participated in the 13 Oct quantum computing visit:

6. IFC (Lt Gen (ret) BJ Shwedo, Director, Institute for Future Conflict)
7. Gen (Ret) Gregory Martin, Air Force Academy Foundation IFC Liaison
8. Research Office (Col Chris McClernon, Director of Research)
9. DF's Senior Associate Dean (Professor Barry Fagin, full professor of computer science and the senior faculty member to the Dean)
10. CyberWorx (Lt Col Judson Dressler, Director, AF CyberWorx)
11. DFCS (Lt Col David Merritt, Department Head, Department of Computer and Cyber Sciences)
12. DFP (Col Rex Kiziah, PP and Head, Department of Physics and current professor of a quantum computing course)

Excerpts and notes (in some cases edited and slightly modified) from an email sent to me to review before sending to HQ Air Force by Col McClernon.

Garry,

The AFOSR Director, Dr. Shery Welsh (SES), asked me last year: "What is USAFA doing in Quantum?" We replied with Col Kiziah's course and a few tangential research projects. Following yesterday's visit, I would like to send a summary of the visit to Dr. Welsh. Can you please review the following and provide any inputs/feedback? This will also be prepared into a WAR from Brig Gen Letendre to Lt Gen Clark.

"Dr. Welsh,

Last year you requested USAFA activities related to Quantum Computing. I am happy to provide an update stemming from an important visit this week.

On 13 Oct, the below attendees visited USAFA to discuss Quantum collaborations. The meeting began with a networking lunch hosted by the 10ABW Vice Commander, Col Brooke A. Rinehart. USAFA then hosted tours of the Academy Center for Cyberspace Research (ACCR), the new \$10M Multi-domain Laboratory, and CYBERWORX, followed by a presentation from Mr. Tony Uttley, President of Honeywell Quantum Solutions (HQS). HQS is the producer of the highest performing quantum computer in the world. They are located in Denver, CO. They use trapped-ion qubits that can be manufactured and controlled more easily and quickly than alternative qubit technologies that do not directly use atoms. The day concluded with an invite to host USAFA researchers at HQS' Denver facility, discuss potential research collaborations, and plan for cadet summer research opportunities. We look forward to this partnership and will provide any significant developments.

USAFA attendees included:

Gen (ret.) Gregory "Speedy" Martin, Institute for Future Conflict
Lt Gen (ret.) BJ Shwedo, Institute for Future Conflict
Lt Col (ret.) Garry Dudley
Col Tom Swoveland, Academic Chief Information Officer
Col Chris McClernon, Associate Dean of Research
Col Rex Kiziah, Professor & Head, Department of Physics
Lt Col David Merritt, Head, Department of Computer Sciences
Lt Col Jud Dressler, Director, CYBERWORX
Mr. Rick Rogers, Deputy Director, Office of Research

V/r,
Chris

CHRISTOPHER K. MCCLERNON, Colonel, USAF, PhD
Associate Dean of Research
US Air Force Academy"

NOTE ADDED 2 JAN 2022 BY GARRY – as you can see, the continued efforts of your '68 Class Gift Committee in a supporting role to the Dean of Faculty and the Department of Computer and Cyber Sciences continues the Class of 68's support of the Cadet Cyber Competition Team. While our involvement now affects the Department of Physics, the Institute for future conflict (IFC), and CyberWorx, our funds continue to be used only for direct support of the Cadet Cyber Competition Team as spelled out in our endowment agreement. The recent work introducing a quantum computing company (Quantinium, Ltd) brings excellent value to our cadets and our Academy. As a result of this in-progress partnership with Quantinium, opportunities for summer research programs and internships for the cadets in the area of quantum computing are a real possibility. I'm sure our cadets on the Cadet Cyber Competition Team will be some of the cadets involved in these new opportunities.

The fourth event – Lunch meeting – 1 Dec 2021

A few notes from our meeting 1 Dec . . .

Thanks to all of you who attended! An excellent meeting by any standard.

Thank you to David Merritt, Judd Dressler, and Philip Makotyn for your notes!

A special thank you to **Heidi Jacobson** for the exceptional dining arrangements.

In attendance:

Visitors

Mark Baisley, CEO & President, Slipglass, Inc., State Representative, District 39

Jimmac Lofton, Business Development, Quantinium

Dr. Mark Jackson, Quantum Evangelist, Quantinium

Vanessa Shapiro, Strategic Growth Leader, Quantinium

Dr. Philip Makotyn, Executive Director, CUbit Quantum Initiative

USAFA/DF Hosts

Lt Col Judson Dressler, Director, AF CyberWorx

Lt Col David Merritt, Dept Head, Computer and Cyber Sciences

Lt Col Tony Vincent, Physics Dept

Lt Col (Ret) Garry Dudley, Volunteer Relationship Facilitator, AOG Board of Directors, Class of '68 Gift Committee

Notes

- Discussion
 - o Colorado is quickly becoming the “Silicon Valley” for quantum; lots of startups and Nobel prize-winning research
 - o Colorado state legislature created a Quantum Caucus and appointed Mark Baisley as the lead
 - o Quantum is more than computing: there is information science, information technology, PNT (insanely precise timing, which affects GPS accuracy), random number generation (upon which most cryptography/encryption is based), and much more
- Next Steps
 - o Guest lecture from CU Boulder and Quantinuum to DFCS and DFPM early this Spring semester
 - o CRADA being developed with both CU Boulder and Quantinuum
 - o All parties are very interested in the whole gamut of possible relationships: CSRP, guest lecture, curriculum review, independent studies, external technical exchanges
- Potential higher viz next steps
 - o Quantum Symposium hosted at USAFA and the State Capitol building
 - o Quantum roundtables for smaller discussions locally
- Explore the possibility of a Quantum Symposium where we bring in AF leaders and Quantum experts (AFRL, industry, etc.) to discuss how quantum technologies will affect today's fight and what needs to be pushed today to prepare us to win tomorrow's fight.
- Look into a Quantum speaker at the Academy Assembly. The team from Honeywell/Cambridge was very receptive to providing a talk, and I think it could benefit the cadets and faculty in this forum.
- Schedule CUBit for quantum technologies lecture at the AFA
- CUBit to provide options for possible academic collaborations with AFA
- CUBit to engage with AFA academy in regional quantum community events

UPDATE

Our first scheduled event due to the 1 Dec meeting is a guest lecture by Dr. Mark Jackson in the Senior Seminar class with ~40 senior comp sci and cyber sci majors on 5 January 2022!
Added – the department of Physics has also added classes to the plan for Dr. Jackson.

Information on three recent competitions:

The President's Cup cybersecurity competition and the Thai Military Academy

On 17 and 18 Sept, the Cadet Cyber Competition Team competed in two separate competitions.

- 1) One competition was the President's Cup Cybersecurity Competition, a national cyber competition aimed at the best cybersecurity talent in the federal workforce. One of the USAFA teams placed high enough to make it past Round 1 Qualifying (top 20% of all teams). Round 2 and the Finals are in October and December, respectively. Keep in mind that our cadets are competing against federal workforce cybersecurity *professionals*!
- 2) The second competition was the first-ever cyber competition between USAFA and the Royal Thai Air Force Academy (Navaminda Kasatriyadhiraj Royal Air Force Academy, established in 1953—older than USAFA!). Two teams from each country competed, and USAFA finished first and second place. This is also the first country versus country competition for the cyber team.



- 3) The team also participated in the DownUnderCTF this past weekend. The team treated this CTF as an opportunity for training and split into smaller teams, approximately five teams of 5. But overall, we still had some great results. Here is a little snippet from the team on the competition:

"The USAFA Cyber Team competed online with a total of 1594 teams worldwide in the Australia-based DownUnder Capture the Flag competition this past weekend. The Delusions of Grandeur had two teams score particularly well - in the top 15%; we had Cadets Vincent Ceffalo, Nico De Ros, John Pan, Jason Ly, and Caleb Song. Placing in the top 19% were Cadets Lauren Humpherys, Daniel Sevilla, Joseph Cates-Beier, and Alon Leshem."

This is the plaque you saw in several pictures as the visitors passed through the cyber range. It was placed inside the facility on an informal and temporary basis to allow the photographer to capture visitors with our plaque present. The official presentation of the plaque is still in front of us. We'll keep you posted when it is to happen.

