44rd Annual

Trenton Computer Festival

The Oldest Personal Computer Show in the World
The College of New Jersey
Ewing, New Jersey

2019 PROGRAM BOOK

Education Building	<<<<< TCF Banquet 6:00 pm >>>>>
Talks, Forums, Exhibitors/Sales (to 3:30 pm)	**Speaker: Tony Sager, Center for Internet Security (CIS)**
Saturday, March 23 - 9:00 am to 5:00 pm	**Speaking on "Cyber Security"**
Talks/Forums start at 10:15 am	**Education Building Room 212**
Sarnoff Museum Tours - 12:30 pm & 4:35 pm	**$32 - Tickets May be Available at Registration Table**

Sponsored by: The College of New Jersey (TCNJ) Electrical/Computer Engineering Department – www.tcnj.edu/~engsci/
with the support of
IEEE Princeton/Central Jersey Section (PCJS) – ewh.ieee.org/rl/princeton-centraljersey
ACM/IEEE-CS – Joint Princeton/Chapters of ACM and IEEE Computer Society – princetonacm.acm.org
NYACC – New York Amateur Computer Club – www.nyacc.org
ACGNJ - Amateur Computer Group of New Jersey - www.acgnj.org
Member of the New Jersey Makers Day Partnership

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Lenny Wintfeld – Mt. Airy VHF R.C. (Pack Rats) – Flea Market

Special Exhibits & Demos

ED Building - First and Second Floor Lobbies:

Demos and Poster Presentations on Robotics, Advanced Technology, Vintage Computers, Mystabar Game & Club/Professional Exhibits

RWH 2nd Floor: Sarnoff Museum (12:30-5 pm)

WiFi: Guests can connect to "Welcome to TCNJ" network and then an email or text with login is sent to them directly.

TCF Keynote Speaker

Tony Sager, Chief Evangelist
Center for Internet Security (CIS)
***Never Say Anything:* The Education of a Cybergeek**
3:40 pm in Room ED-115

Get a Ham Radio License in One Day!

Sponsored by the David Sarnoff Radio Club <www.n2re.org>

If you wanted to get an amateur radio license but never had the time, now is your opportunity! The FCC has changed the rules so that no Morse Code proficiency is required. To obtain the entry-level Technician license, all one has to do is pass a multiple-choice exam. With a Technician Class License, one may participate in Amateur Radio and enjoy privileges for operation on some of the HF amateur bands, use of VHF&UHF repeaters, participation in local Amateur Radio Emergency Services (ARES), the annual American Radio Relay League (ARRL) Field Day, and many other activities. We will be holding **"HAMCRAM 101″ in ED-103** from 9:00 am thru approximately 1:30 or 2 pm. We will have a short morning break, as well as a break for lunch. Following the HAMCRAM, we will run through a few practice exams and Q&A in preparation for the testing session, which will begin at 3:30 pm. The course will provide participants with an overview of the requirements needed to pass the FCC Technician License exam. **Pre-study** using the materials linked below is **STRONGLY ENCOURAGED**, since it is not possible to *teach* all of the material in one cram session. At 3:30 pm the FCC examination will be given by ARRL-certified Volunteer Examiners (VEs). One does not have to attend the HAM CRAM 101 or pay for admission to TCF to attend the exam session. An exam fee ($15.00) must be paid by each examinee. Two forms of identification (at least one must have your photograph) will be required to take the exam. All license exams will be offered (Technician, General and Extra) at this testing session. If upgrading, bring an original and a photocopy of your current license. Results of your test will be provided after the exam session is completed. The slides for the ham cram are at: https://drive.google.com/open?id=1g7TCg2mHoUnbKvM1mPpUZWMxFNnhs7Pv. A truly wonderful and free study guide can be found at http://www.kb6nu.com/tech-manual/. Online practice exams are also of great benefit, see http://qrz.com/hamtest/. *Students are urged to take advantage of these resources*.

********* 10:15 am to 11:10 am **********

ED-115: How to be Safe in Cyberspace, Thomas E. Kenny, DevSecOps.

Abstract: There is an invisible threat in your home and this cyber threat is coming from inside the house! From all of your internet connected devices! This cyber threat is getting worse every day. Businesses have teams to prevent and mitigate these attacks but what is an individual to do? Antivirus software and firewalls can only do so much considering that attack methods are constantly evolving to get around known precautions and to exploit new vulnerabilities. Attend this talk to learn how to help yourself and your loved ones to be safe in cyberspace via practicing good digital hygiene. After this talk, you'll never look at your thermostat the same again.

Bio: Thomas Kenny has been an IT professional for decades at several major telecommunications companies. For the past 9 years, he's been specializing in developing Cybersecurity tools. He is currently a DevSecOps champion for 5 software development projects. Architecting and assisting each team to improve their continuous integration/deployment practices to achieve scalable deployments faster with quality and security. This has included the design and implementation of an automated configuration management system to support federal NIST 800-53 security controls. Thomas has a MS in Mathematics and the (ISC)2 CISSP certification. To stay on top of the ever-changing cybersecurity world, Thomas is an avid cybersecurity podcast listener.

ED-211: Introduction to Cricut and Other Home Electronic Cutting Machines, Brenda Bell; Michaels and ACGNJ.

Abstract: This session will discuss what are home cutting machines, and their many uses. I'll look at some of the models currently on the market. I will focus on the current series of *Cricut* cutters, using *Design Space* software to demonstrate how to design and produce a simple project.

Bio: Brenda Bell has given TCF talks on topics ranging from Internet searching to Connected Medical Devices to special-interest social networks. Brenda acquired a *Cricut Explore Air* in July and spent her first two weeks with the device figuring how to get around its software's limitations using third-party software to create her own designs. Brenda has been leading classes at her local Michaels store since 2017. In her spare time, she is Secretary of ACGNJ, where she has facilitated the Mobile Devices SIG for the past eight years. Brenda is an independent crafter and is not affiliated with, nor authorized by *Cricut* or *Provo Crafts*, nor are her classes and presentations "official" *Cricut* instruction.

ED-209: Wordpress Bootcamp, Louis Judice, The Round Mountain Group.

Abstract: Whether a blogger, academic, corporate IT staffer or entrepreneur, WordPress skills are becoming more and more important. 2019 brings a new major release and a brand new editor. In addition to the basics, I introduce Divi, a meta theme with nearly infinite possibilities and WooCommerce a platform for selling almost anything online. **(Continues in next session).**

Bio: Lou Judice is Founder of Round Mountain Group and responsible for developing hundreds of Wordpress sites. Previously, he was in charge of mobile internet strategy for HP and launched the world's first public mobile website. He has also worked for DEC, GE and RCA Labs. He is a member of the IEEE and the TCF Steering Committee.

ED-208: So YOU Want To Be A Super Spy? - Practical steps from Novice to Spymaster, Cody Hofstetter, IT/Cybersecurity firm.

Abstract: Spycraft is the realm of black budget operations and Nation State Actors, but no longer! In this talk, we'll be covering a small subset on the basics of spycraft and how technology with costs in excess of multi-millions of dollars less than a century ago have evolved and can be achieved today on the budget of a fry cook.

Bio: Cody Hofstetter is the Founder and CEO of an IT/Cybersecurity firm specializing in vulnerability assessments, penetration testing, forensic investigation, and advanced data recovery/destruction. He is chairman of a non-profit that advocates Free and Open Source Software adoption to assist businesses and non-profits in utilizing FOSS to reduce their base operating expenses so they may allocate their limited resources elsewhere. Cody's background is originally in finance and has been forming and buying companies since the age of 19. He currently divides his time between four main ventures: his IT/Cybersecurity firm, the FOSS non-profit, board Treasurer for the only known working steamboat on the East Coast dedicated to water-shed/ environmental education, and his latest business acquisition, a health-oriented and local community focused restaurant.

ED-207: The Space Shuttle Computer Systems, Frank O'Brien, Infoage Science/History Center.

Abstract: Flying the Space Shuttle, from launch until landing, is totally dependent on a complex of computers that interact with every major system onboard. Most importantly, the required level of reliability demanded sophisticated redundancy schemes that had never been implemented before. In this talk, we will discuss the hardware, software, redundancy management and the user interface of the Shuttle computer systems.

Bio: Frank O'Brien has been involved with NASA for 25 years, most recently as a Solar System Ambassador. His book on the Apollo Guidance Computer has been well received, and he is currently working on a book giving an engineering review of the Apollo Spacecraft. As a volunteer for Infoage Science/History Center, Wall, NJ, he lectures monthly on a wide variety of space related topics.

ED-206: Learn How to Solder Workshop, Jonathan Allen, RF Consultant.

Abstract: Soldering is an indispensable skill for anyone engaged in practical electronics. This workshop will begin with a basic explanation of soldering theory, followed by illustrated instruction in techniques, procedures, and precautions. Participants will then practice by assembling kits that involve a variety of soldered joints and connections, while instructors offer coaching and advice. I will evaluate the results and entertain questions. The hands-on part of the soldering workshop can accommodate a limited number. They must be at least 13 years old, and preference will be given to students. (Signup will be during the workshop presentation).

Bio: Jonathan Allen received his Ph.D. in applied physics from Washington University in St. Louis. Most of his career has been in photovoltaic R&D, but he also designs and builds custom RF power systems and instrumentation. He is currently an independent consultant. For the past six years, Jonathan Allen has worked as a volunteer restoring and documenting the Sarnoff Collection at TCNJ. He has had more than 60 years of experience in practical electronics and was NASA certified in soldering and circuit construction.

ED-113: Demystifying Mystabar, Randall Cole. Vertical Screen.

Abstract: Mystabar is an adventure game in which players solve a series of puzzles using strategy, hints, internet research, and clues found within the hosting establishment. This talk will kick off Mystabar for TCF 2019 and players will be able to solve Production #001 "A Spy is Born." This talk will cover, how to play, the technologies used to create Mystabar, and answer any questions participants have. Mystabar players log into a cloud-based mobile-first website using smartphones, tablets, or laptops information from the site is combined with information from the establishment to solve puzzles and score points. This is an escape the room type of experience.

Bio: Randall Cole is Vice President of Information Technology for Vertical Screen, a background check company. He has been in IT for more than 20 years, specializes in enterprise networking and security, and has managed all aspects of an IT department. He is a Microsoft CSE, CPMP, ITIL Certified, CISSP and CEH. Randall has an MS in Information Science from Pennsylvania State University and a Bachelor's degree from Temple University. He is an adjunct instructor for Gwynedd Mercy University, teaching Computer networking and security. He has also competed for the last ten years in various competitive hacking contests at DEF CON, as well as a volunteer for the convention.

ED-110: Satellite Amateur Radio Communications Today, Steve Bossert, Hudson Valley Digital Network.

Abstract: Did you know there is a total of more than 21,000 MHz of spectrum available to amateur radio operators looking to experiment with satellite communications today? While much of this spectrum is above 1.2 GHz, this still leaves over 60 MHz of varied spectrum that can be used by those holding the easiest to get Technician class amateur radio license and with minimal expense. This discussion will cover the most common spectrum used today for amateur radio operators interested in satellite communications, additional spectrum for users to be mindful of, and a review of the most active satellites that can be used with less than $100 of invested equipment. Steve, K2GOG will present this information in a 50 minute presentation along with a few recent recordings of amateur satellite contacts and also share some further information about easy to monitor non-amateur radio satellites using the same equipment. Q&A will be permitted at the end dependent on time.

Bio: Steve was licensed while in high school 20 years ago and now has been a ham for more than half of his life. Early interests in electronics and communications have led him to have a successful career in semiconductor and wireless strategic advisory services to the worlds top disruptive technology vendors. Steve is the co-founder of the Hudson Valley Digital Network and currently resides in grid FN31; a system used by satellite operators to easily and quickly identify their location.

ED-109: Quantum Computing and Beyond, Barry Burd, Drew University.

ing Applications for Android Phones and Tablets

Abstract: In the not-too-distant future, quantum computing will blow away all the algorithms that currently keep our data secure. Quantum computers will do this by performing thousands of computations at once. But how can we sift the correct answer from all these simultaneous calculations? In this talk, I'll explain how quantum computers find needles in virtual haystacks. I'll also describe the next frontier: Solving problems that, on one level, are theoretically unsolvable.

Bio: Barry Burd is a professor of Mathematics and Computer Science at Drew University in Madison, NJ. He is the author of several articles and books, including *Java For Dummies*, *Android Application Development All-in-One For Dummies*, and *Java Programming for Android Developers For Dummies*, all from Wiley Publishing. He received an M.S. degree in Computer Science at Rutgers University and a Ph.D. in Mathematics at the University of Illinois.

ED-107: Hands on Arduino Workshop for beginners, Katalin Frolio, Lockheed Martin in Moorstown. (Continues to 2:35 pm).
Abstract: The main goal of the workshop is to introduce participants to electronic devices and basic circuit theory. The Arduino is an affordable, flexible, open source microcontroller platform using a simplified C programming language, and it is designed to make it easy for hobbyists to create homemade projects. Participants are expected to bring a PC, and in order to save some time, they are also encouraged to download the Arduino software ahead of time. Step by step instructions can be found at the website: https://www.arduino.cc/en/Main/Software. **Things to Bring:** A laptop computer with a USB port. **Background Required:** Basic algebra for solving simple equations. **Intended Audience:** Anybody who is interested in electronics.
Bio: Katalin Frolio graduated with a BS in Electrical Engineering from TCNJ in 2014. She currently works as an Electrical Engineer at Lockheed Martin in Moorstown, NJ. She is the chair of the IEEE Young Professionals Princeton/ Central Jersey Section. She is also a graduate Electrical Engineering student concentrating in High Frequency Systems at Villanova University.

ED-105: Introduction to Object-Oriented Programming and Design Principles, Michael Redlich; ExxonMobil Research and ACGNJ.
Abstract: Object-Oriented Programming (OOP) is a programming paradigm that models real-world objects. The most well-known and widely-used OOP languages are C++ and Java, but some languages, such as Simula-67, were around much earlier. The advantages of OOP over structured programming include modularity and code re-use. As OOP has evolved over the years, things like design patterns and design principles have guided developers to write applications that are more adaptable to modification. This seminar will introduce OOP, its basic attributes (encapsulation, abstraction, inheritance, and polymorphism), the class mechanism, and some design principles that have led to the development of design patterns. Example Java source code will be reviewed to demonstrate the features of OOP and design principles.
Bio: Michael Redlich is a Senior Research Technician at ExxonMobil Research & Engineering in Clinton, NJ and a Java Queue news editor at InfoQ (views are his own). He has been a member of ACGNJ since 1996, serves on the Board of Directors as Past President, and has been facilitating their Java Users Group since 2001. For more details about Mike, please visit http://about.me/mpredli.

ED-204: Lockpick Village, TOOOL NJ.
Abstract: This workshop discusses how to pick locks and is repeated at approximately half hour intervals.
Bio: The mission of The Open Organization Of Lockpickers (TOOOL) is to advance the general public knowledge about locks and lockpicking. By examining locks, safes, and other such hardware and by publicly discussing our findings, we hope to strip away the mystery with which so many of these products are imbued. The more that people know about lock technology, the better they are capable of understanding how and where certain weaknesses are present. This makes them well-equipped to participate in *sportpicking* endeavors and also helps them simply be better consumers in the marketplace, making decisions based on sound fact and research.

***********11:20 am to 12:15 pm***********

ED-115: State of Cyber Crime in New Jersey, Michael Geraghty, NJCCIC.
Abstract: This presentation will provide an overview of the different types of profit-motivated cybercrimes targeting the US. Analysts will provide an overview of the tactics and trends in cybercrime, including, but not limited to, ransomware, business email compromise, data theft, skimming devices, point-of-sale malware, malicious advertising, and other extortion tactics. A Q&A session with attendees will conclude the presentation.
Bio: Michael Geraghty is NJ's Chief Information Security Officer and the first Director of the New Jersey Cybersecurity & Communications Integration Cell (NJCCIC) located at the Regional Operations Intelligence Center. Director Geraghty manages the day-to-day functions of the NJCCIC, the State's central hub for cyber operations and resources. Geraghty brings a wealth of public- and private-sector experience to this role, having served as Chief Information Security Officer (CISO) of the Hudson's Bay Company, Chief Information Officer of the National Center for Missing and Exploited Children, and Vice President of High Technology Investigations at Prudential Financial. Previously, hr served 12 years with the NJ State Police, where he led the formation and development of the High Technology Crimes Investigations Unit. He has lectured extensively throughout the world on the topic of cybersecurity, high tech investigations and computer forensics, providing technical and investigative assistance to law enforcement agencies both domestically and internationally, including the FBI, Secret Service, Department of Homeland Security, Naval Intelligence, New Scotland Yard, and the Royal Newfoundland Constabulary Service. He has provided expert testimony before Congress and in federal, state, and international courts on computer crime investigations and forensics. Geraghty is also a past president of the Northeast Chapter of the High Technology Crimes Investigation Association and has held leadership roles in the National Strategic Policy Council on Cyber and Electronic Crime.

ED-211: Workshop: Fundamentals of Writing Proposals and Requirements, Brian Berenbach, independent lecturer and author.
Abstract: This tutorial is the core of a three day course that the presenter provides to industry. It covers the basics of requirements writing including: 1) Properly structuring requirements, 2) Relationship of requirements to proposals & contracts, 3) Eliminating ambiguity from requirements, 3) Creating a requirements database schema and 4) Conducting requirements reviews. The tutorial is given at the novice level, and would be of interest to anyone writing or reviewing requirements. It is also useful for those creating proposals, requests for proposals, and writing contracts. **(Continued in next session).**
Bio: Brian Berenbach retired from his position as a senior systems engineer at Siemens Corporate Technology in 2013. He currently lectures in systems engineering at the Georgia Institute of Technology. Brian Berenbach is an INCOSE ESEP, an IEEE Senior Member and an ACM Distinguished Engineer. He has over 40 years' experience as a systems engineer and project manager, and holds 5 patents in systems engineering. In addition to his many conference papers, he is the author of the text *Software & Systems Requirements Engineering: In Practice,* published by McGraw-Hill.

ED-209: Workshop on Wordpress, Continued

ED-208: 8-bit Game Development in New Jersey: An Insider's Experience, Scott Marshall, author.
Abstract: Silicon Valley and Japan dominate early video game development, but there were more modest and lesser known operations in other parts of the country, including right here in New Jersey. The presenter Scott Marshall worked on dozens of games, on many platforms for several New Jersey companies as an independent contractor, and will share his experiences from the inside as well as a bird's eye view of how the seeds of 8-bit game development began, spread, and flowered in the Garden State from 1980 to 2001.
Bio: Scott Marshall designed and programmed 8-bit and 16-bit games as an independent contractor for New Jersey companies, including Imagineering, Inc., Absolute Entertainment, Morning Star Multimedia, and Majesco, Inc., on Atari, Sega, and Nintendo consoles and handhelds. Before working on commercial game systems, he was an application developer for RCA's personal computer project, contracted with Educational Testing Service in their image processing department, and on Sarnoff Labs' digital cinema project. Scott's previous presentations for the Trenton Computer Festival have included selling on eBay, the history of widescreen movie technology, a biography of Ralph Bayer, the inventor of the home video console, the art and history of the Theremin, modern digital tools for self-publishing, and an assessment of the history and possible future for intelligent and conscious computing machines. Now retired, in 2017 he published his first book, "Love, Explained," on the biology and psychology of love and affection, and his second book was released last month.

ED-207: Cybercrime and Theremin Zen, Kip Rosser, artist.
Abstract: According to the Oxford Dictionary: "Before there was *cyber*-anything, there was the field of cybernetics. Pioneered in the late 1940s by a group of specialists in fields ranging from biology to engineering to social sciences; cybernetics was concerned with the study of communication and control systems in living beings and machines. The interest in how systems work is reflected in the etymology of *cybernetic*, which comes from the Greek word kubernētēs (κυβερνᾶν), 'steersman', from *kubernan* 'to steer'." Now, here we are in the twenty-first century contending with a new phenomenon and the word it has spawned: "cybercrime." Wait…hold up…hee haw..stop…now that I think of it, it's not new at all! "The study of communication and control systems in living beings and machines?" And the misuse of it – the crime part? That's been going on since before the term "cybernetics" was first conceived! What the heck does all this have to do with the Theremin? Let's just say it has more to do with the inventor than the instrument. Not the crime part – the cyber part. The "steersman" part. Because after Leon Theremin invented the instrument, he steered history again and went on to invent something that changed the world of espionage forever. Just as the instrument ushered in the dawn of electronic music, some of his other later inventions steered us out of the dawn and into the shimmering daylight of the age we live in right now. The age of six billion "security" cameras worldwide, the age of virtual global finance, of Alexa recording everything we say while we think she's just playing our favorite music and ordering our pizza. The age of our planet being divided up into fifty-seven trillion ten by ten foot squares, each with a three word code. Gee whiz…what could possibly go wrong?
Bio: Kip Rosser's solo performances, staged productions, award-winning compositions and industry recognition have earned him a reputation as one of the most accomplished Thereminists playing in the world today. In 1996, while

working as a graphic artist, playwright and director for the stage, Kip Rosser crossed paths with the grandfather of electronic instruments. He purchased a kit and built his first Theremin. Rosser typically moves beyond a standard recital format, making for a unique event that combines music (ranging from classical to jazz to popular) with humor, stories, performance art, animation and video, continually pushing the Theremin's musical and technical boundaries. He's done a whole bunch of things from CDs to theater, to free online Theremin lessons to Theremin comedy to concerts to movie scores. The big question is: What the heck kind of weird-ass (but fun!) stuff is he going to try today?

ED-206: **Cutting-Edge Web and Digital Connectivity in 2019, Eva Kaplan; Consultant in Computer Ed., STEM, Photogenetics and Chromotherapy.**
Abstract: For most of us, accessing the Internet through laptops and other mobile devices currently require connectivity through a Wi-Fi hub. The general public needs to locate "hot spots" and is familiar with using "passwords". 2019 is now offering private, closed, secure, wireless networks for families – such, as "GrandPad". There is now Cloud Computing not only for corporations but for individuals. There are increasing numbers of websites by subscription which will be recommended. With these positives are also negative trends: encouraging addictions with online gambling, tracking, and infringement of data security on Social Media (along with its bullying and inaccurate information). TFC's Guru is on top of Internet trends - and as usual offers a composite of newest exciting websites.
Bio: Eva was inducted into her college's "Hall of Fame" as a "Pioneer in Computer Education." Her Computers and Kids summer camp, which ran from 1982 to 2013, received innumerable media recognitions and, professional accolades. Her educational approach preceded STEAM -, combining science, technology engineering, arts, and mathematics! The arts, element came naturally as Eva is an exhibiting artist, art teacher, and pursued, music studies extensively at The Third Street Music Settlement, privately, as, well as having John Cage as a mentor. Eva has been a speaker for TCF since its, inception in 1976,

ED-113: Robotics' Pavilion – An Introduction, Seung-yun Kim, TCNJ.
Abstract: A variety of robots will be demonstrated at the new TCF Robotics' Pavilion. Robotics is an emerging multi-disciplinary area in Science, Technology, Engineering, and Mathematics (STEM) that combines mechanical, electrical and computer engineering in the design and construction of robots to perform specific tasks. It requires a working knowledge of electronics, software, and mechanics. Before the coining of the term robotics, there was interest in ideas similar to robotics, namely automata and androids, dating as far back as 400 BC. Robots are used in industrial, military, exploration, home, academic, and research applications. Although the appearance and capabilities of robots vary vastly, all robots share the features of electronic sensors, and a movable structure under some form of autonomous electronics, computer, and software control. This presentation introduces the element of robotics with examples of uses and future trends. It is further enhanced through many multimedia-based examples of the state of the art and further directions of research, and the demonstrations of real robots at the Robotics' Pavilion.
Bio: Seung-yun Kim is an Assistant Professor in the Department of Electrical and Computer Engineering, and First Year Program Coordinator of School of Engineering at TCNJ. Seung-yun earned a PhD and MS from University of Dayton and a BS at Saint Louis University all in electrical engineering. His research interests include collaborative computing, human-centered systems, mobile and ubiquitous computing, and intelligent robotics. He has been awarded over $500,000 in grants. He has published near 40 refereed journal and proceedings papers, and serves as a reviewer for the NSF and several technical journals. He has extensive experience in outreach to K-12 programs and promoting STEM education.

ED-110: Stock Market Timing Using Neural Networks and Genetic Algorithms – Latest Developments, Donn Fishbein, Nquant.com.
Abstract: Timing financial markets is essential in order to maintain a consistent rate of return. Buy and hold strategies work well only when the markets are heading north. Market downturns can be rapid and severe, and take years to recover from. This talk will address 1) the use of technical analysis in timing financial markets, 2) introduce artificial neural networks and genetic algorithms, and their application to technical analysis, 3) a practical system for timing the markets using these tools, and 4) the importance of testing and validation of trading systems, especially those whose inner workings may not be apparent.
Bio: Donn Fishbein, MD, PhD, is a physician and scientist who has investigated and traded the financial markets for > 25 years. His particular area of interest is mathematical systems with biological roots. For the past fifteen years, his focus has been on hybrid artificial neural network and genetic algorithm systems, both for end-of-day trading and more recently for day trading systems. He has lectured on these subjects, describing profitable systems for trading equities, exchange traded funds, and index futures. He contributes trading signals to a neural net trading website and offers consulting services and private development of trading systems based on these technologies.

ED-109: RaspBerry Pi & IoT (PIoT), Bill Brutzman, ACGNJ.
Abstract: IoT (Internet of Things) is a hot topic. Bill will demonstrate how to use a RaspBerry Pi for IoT. He will capture physical events using a sensor, and send the data to a website. He will show attendees how they can connect to their own browsers on a mobile phone, tablet or notebook computer. He will next discuss hardware, focusing mostly on the Pi, Pi-Zero, alternatives and add-ons; and where and what to buy. He will then discuss operating system(s) and hosts (Linux, Windows RT, AWS, GreenGrass, Azure, Google, etc.). Lastly, he will give a *code walk-through* of Python, Golang, html and JavaScript. Code will be available with a Linux cheat-sheet. For an encore, Bill will provide, tips, tricks, lessons learned, resources and possible prizes.
Bio: Bill Brutzman's day job is mainly writing code at a manufacturer in Northern New Jersey. He holds a BSEE from NJIT and is active in the Amateur Computer Group of New Jersey (ACGNJ.org).

ED-107: Hands on Arduino Workshop for beginners, Continued.

ED-105: Getting Started with Java, Michael Redlich, ExxonMobil Research and ACGNJ.
Abstract: Java is an object-oriented programming (OOP) language created by James Gosling at Sun Microsystems that was first introduced to developers in 1995. It is one of the most popular programming languages for client/server web applications and there are many scripting languages (Clojure, Groovy) that seamlessly interact with Java. Much of Java's language syntax was derived from the C++, but as James Gosling once stated, "Java is C++ without guns, knives, and clubs." This seminar will introduce the Java programming language, provide a brief overview, how to get started, review some Java keywords, introduce the Java class mechanism, and review a small, working Java application. Since knowledge of OOP is vital in the development of robust applications, the OOP paradigm will also be introduced along with a brief discussion of the advantages of OOP over structured programming. The example Java application will demonstrate how the attributes of OOP are utilized within Java classes.
Bio: Same as one hour earlier in this same room.

ED-204: Lockpick Village, Continued.

***********12:25 pm to 1:20 pm***********

ED-115: Cybersecurity Issues for Drones, Donna Schaeffer, Marymount University, and Patrick Olson, National University.
Abstract: Drones are doing tasks that have cybersecurity implications. Pipeline inspection is quite labor intensive, and drones can survey terrain that may be hard for humans to navigate. Drones have been used in nuclear waste site cleanup, thus limiting human workers' exposure to radiation, but nuclear facilities are a critical infrastructure that need to be secure. The field of firefighting provides another example. In performing these tasks, drones depend on networking and computing. This dependence means that cybersecurity is a necessity. This presentation will focus on cybersecurity issues for drones.
Bio: Donna M. Schaeffer is a Professor and Director for the Doctoral Program in Cybersecurity at Marymount University. She holds a PhD in Management Information Systems from Claremont Graduate School. Patrick C. Olson is a Professor at National University. He holds a PhD and Master's in Systems Science from the University of Southern California. They are co-authors of *Emerging Technologies and Public Policy*, forthcoming from Sage Publications. They reside in Bucks County, PA.

ED-211: WoodPress Bootcamp, Continued.

ED-209: Explicit Embedded Programming, Bill Wong, Electronic Design and Informa.
Abstract: Much of the programming for embedded systems today use C but this language is prone to errors because it requires the programmer to catch many problems. SPARK is an embedded programming language based on Ada that allows precise control over interfaces. In this session we delve into some of the more important features of SPARK and Ada 2012 such as contract programming.
Bio: Bill Wong is Senior Technology Editor for Electronic Design magazine. He has a BS in Electrical Engineering from Georgia Tech and MS in Computer Science from Rutgers University. He has worked for a wide range of companies including RCA's Sarnoff Research Center, Monroe Systems for Business and Rising Star Industries. He has been a freelance writer and book author as well as the first Director of PC Labs at PC Magazine.

ED-208: Internet Job$$$, Donald Hsu, Dominican College.
Abstract: Amazon, Expedia, Facebook, Google, Linkedin, NetFlix, Priceline stocks are up. Yes, the economy is booming. Retirees are working! Eighty percent of people get jobs from Internet. Accounting needs 2.1 million by 2022 (Forensics, QuickBooks, PeachTree, MS Dynamics); Application Developers (C++, Java, C#) - thousands of jobs, but no applicants; Cloud Computing (Amazon AWS, Dropbox, IBM, Microsoft Azure, Salesforce, VMWare); Big Data (MS Sql server, MongoDB, Oracle 11g, SAP, Data Warehouse), starting at

$85,000; Networking (Cisco, Info Security, A+, Network+, CIEE, CISSP); Systems (Unix, Linux, Window 10); Analytics (IBM RSA, IBM SPSS, SAS, R, Python, Hadoop), Social Media Manager (FaceBook, Linkedin, Twitter, Pinterest, Snapchat), Artificial Intelligence, Deep Mining (Project/Product Manager, Global Finance, Sales/Marketing of Tech Product/Services). Computer majors are down 50 to 70% in US universities. This means more jobs for you and me. Bring a resume and get a free critique from the speaker.

Bio: Donald Hsu is a Professor at Dominican College, Dissertation Chair at University of Phoenix, and President of the Chinese American Scholars Association (CASA). He taught > 70 subjects from Accounting to Unix; > 13,000 of his students and clients work at Amazon, AT&T, Bank America, Facebook, Goldman Sachs, Google, IBM, JPMChase, Mercedes Benz, Microsoft, Morgan Stanley, New York Presbyterian, Oracle, Salesforce, Siemens, Sony, Toyota, UPS, Verizon and other Fortune 500 firms. CASA ran 26 successful E-Leader conferences in Asia and Europe, http://www.g-casa.com. He has traveled to 88 countries in Africa, Asia, and Europe for international business. Don's profile with > 8,000 partners/clients can be found on Linkedin at https://www.linkedin.com/in/dohsu.

ED-207: Workshop on Building your own Digital Amateur Radio Repeater (Hotspot) for < $100, Joseph Apuzzo, IBM.

Abstract: The popularity of Digital modes in Amateur Radio has grown exponentially over the last few years due to the affordability of VHF/UHF digital handheld radios. A large part of this growth can be attributed to the impact of hot spot devices and the unique learning capability they create. This talk will cover the required open hardware and free software that can be used to create a VHF/UHF hot spot device for under $100. Digital Voice Hotspots connect to the internet and allow Amateur Radio Operators to use their UHF/VHF Digital handheld to talk with other hams around the world. The hardware consists of two parts a MMDVM board that connects to a Rasberry Pi Computer. The free software that drives this board is the PiStar.uk distribution. DMR will be the major voice mode featured, there will also be a brief discussion of Yaesu Fusion, Icom D-Star as well as other commercial modes like NXDN and P25. Attendees of this talk only need to be familiar with a Rasberry Pi and have or plan to get a least a Technician Amateur Radio License. Even though the talk will focus on a home hotspot, there will be a discussion on how this approach can be applied to a club repeater. Thus, there will be something for everyone! **(Continued in next period).**

Bio: Joe (N1JTA) is a founding member of HVDN.org a driving force in the area of Digital Communications. He is also the creator of the hvopen.org yearly "Mad Science Fair" where adults show off there own science experiments to inspire kids of all ages. He was a speaker at this year's Open Hardware Summit at MIT. His day job is working for IBM on both High-Performance Computers and now on building Quantum computers. Professionally he has taught classes through the world, written two books and holds two patents. He has an MS in computer science and a BS in Electrical Engineering.

ED-206: Flying to Russia, the North Pole & Around the World in a Small Plane, Martin Balk, Martin Aviation, LLC.

Abstract: The general public thinks it takes huge amounts of money and skill to own and travel with a personal aircraft. The truth is, from the speakers personal experience, this type of transportation is readily obtainable by most people. This talk will focus on six seat or less aircraft that are capable of trips around the world, or at least to Alaska, Russia and beyond. I will also discuss my latest project to acquire and fly a WWII DC-3 from South Africa back to Princeton, NJ. (I can now show it to you. Just ask).

Bio: Marty was born in NYC in 1950 and grew up in New Milford, NJ. He attended NJIT where he received a BS in Electrical Engineering. After working as an electrical engineer for five years, he opened and ran Linden Avionics Inc. (aircraft electronics) for 20 years. Whiling operating the shop, he added an instrument and multi engine rating to his commercial pilot's certificate. After leaving aviation for a stint in industry and other positions, he obtained a MBA, an Airline Transport Pilot certificate, then an A&P (Airframe and Power plant mechanics) certificate with Inspection Authorization. He is also, a Flight instructor with Instrument endorsement, certificate. He obtained a DC-3 (first true airliner) rating. Other flying notoriety, Marty has flown a Cessna 210 from Sydney, Australia back to NJ (before GPS), a Piper Cherokee 6, Cessna 205 and 172 to Alaska. While in Alaska, with the 205, he jumped over the Bearing Sea to Russia for a day. With the 205, he also flew to Greenland (over the ice cap) and on to Iceland. With another 210, he went almost to the North Pole and plans another attempt in 2020. Last year, he went around the world with a friend in a 210. This year, he purchased and flew back to NJ a DC3 from South Africa. It is now parked at Princeton Airport. Marty is the owner and COO of Martin Aviation that provides flight instruction and aircraft maintenance.

ED-113: IC Math Acceleration and Parallel Computing Architectures for Digital Signal Processing and Graphics Applications, Jerry Bellott.

Abstract: A variety of unique computing architectures are employed on IC's for math acceleration and to accomplish computing tasks in parallel. Architectural elements for digital signal processing (DSP) and graphics processing units (GPU ICs) are discussed in this talk. In addition, security measures taken to ensure data privacy and privileged use of computing resources are covered. System on a Chip (SoC) platform solutions for many products include both microcontroller and DSP architectural features for high speed processing in parallel. They contain a complement of co-processing capabilities and I/O interfaces that are tailored to the high-speed processing application space of the platform. Platform products have unique cybersecurity challenges and solutions that are discussed in this talk. High speed processing products also include PC GPU ICs employing large blocks of parallel execution units and FPGA's employing non-Von Neumann architectures to exploit parallelism to accomplish high speed signal processing. This presentation covers: 1) Architectures for traditional DSPs and application specific SoC solutions. 2) FPGA solutions employing signal processing IP with more than 2000 signal processors. 3) Architectures used by GPU ICs. Processing of a large number of kernel threads using parallel execution unit architecture. DSP applications include IoT wireless interfaces, PC graphics, cellular products, IP networks, medical monitoring equipment, medical imagining, consumer audio and video compression and de-compression, machine vision, auto engine monitoring and control, and more.

Bio: Jerry Bellott earned his MSEE degree from Georgia Tech in 1980, where he was a Research Assistant in DSP processor architectures. He also has a BSEE from West Virginia University. After working in the AT&T PC Development Department for three years in the late 1980's, he worked in the Bell Labs Microelectronics Division DSP design center for 9 years, until 2000 where he contributed memory architectures and DSP chip design specifications in addition to designing evaluation circuit boards for the cellular DSP product line. He designed the first 2G cellular circuit reference design for a new DSP and cellular circuit chipset for GSM cell phones that was used in the design of the Motorola StarTac, the first truly compact flip-top lid cell phone. As an applications engineer, he worked with PALM on the design of the PALM VII which employed a Bell Labs DSP. The PALM VII was the first handheld wireless device with application icons and Internet access. In 2004, he worked on the MathStar 64 core DSP project at Valley Technologies, Inc. in Tamaqua, PA. He has since worked for two engineering companies responsible for design of HD video equipment and signal processing hardware as a technical documentation writer. Since then, he has volunteered for the IEEE in numerous roles as a guest speaker on Product Development Methodologies, IT Equipment Product Development, and System Design and Enterprise Quality Management, among other presentations. He is current chair of the IEEE PCJS Section Signal Processing Society Chapter. His website is www.gtdigital.org Email: jbellott.ieee@outlook.com.

ED-110: Security Features of Windows 10, David Soll, Omicron, LLC.

Abstract: Windows 10 is the most secure operating system from Microsoft to date. It includes tons of security features, many of which are invisible to the end user. David will discuss many of these security features, how they work, and how to work with them. Due to time limitations, only some of the more important security features will be discussed, but time will be set aside for questions and answers at the end of the session.

Bio: David Soll is the CTO of Omicron Development, LLC. He is responsible for the overall technical direction and technology solution set provided by Omicron. David received a BS in Electrical Engineering from Drexel University and has been working in Information Technology for over 25 years, more than 20 of them with Omicron. He is the past Chair of the Princeton Central Jersey chapter of the IEEE Computer Society and is a senior member of the IEEE. David is also the past Chairman and current board member of the Princeton chapter of the ACM and a senior member of the ACM. David has a long history of innovation working with Microsoft. He has worked with virtually every version of operating system that Microsoft has produced and has given many presentations on them. He received a prestigious IEEE Region 1 Award for his technical contributions to information technology (IT). He also is the founder and current chairman of the IEEE/ACM IT Professional Conference (ITPC) held in conjunction with TCF.

ED-109: Develop Apps for iPhone and Android with Flutter, Barry Burd, Drew University.

Abstract: It's a multi-million-dollar problem: How to build an app that works on both iPhones and Android phones. Companies hire two teams of programmers, create two separate code-bases, and maintain two different apps that do essentially the same thing. Google's cross-platform solution, named Flutter, went into Version 1.0 in December 2018. In this talk, I'll show how you can use Flutter to create a single app that runs on both iPhones and Android phones.

Bio: Same as in this room two hours earlier.

ED-107: Arduino Workshop, Continued

ED-105: Introduction to Python, Chuck Knight , ExxonMobil Research.

Abstract: Python is a very powerful programming language used in a variety of engineering and scientific settings. Its popularity has spread in recent years mainly due to its ease of use and large collection of support libraries. In this talk I'll provide a gentle introduction to the language using a hands on,

demonstrative approach. By the end of this talk, attendees should know how to get started with writing simple scripts in Python, and have a general understanding of the Python ecosystem.

Bio: Chuck Knight has been working in the IT industry for 37 years; the last 20 years with ExxonMobil. He has spent his career working on various scientific and high performance computing platforms for applications including NASA's space shuttle thermal analysis, reservoir simulations and seismic imaging, as well as many other proprietary and commercialized efforts. Chuck is currently the Software Engineering Advisor for ExxonMobil's Scientific Computing team at ExxonMobil's Corporate Research Center. Chuck obtained his BS from Michigan State University, and his MS from the University of Houston, both in Computer Science, and an MBA.

ED-204: **Lockpick Village, Continued**

***********1:30 pm to 2:25 pm***********

ED-115: A 2020 Vision of U.S. Election Security, Rebecca Mercuri, Notable Software, Inc.

Abstract: Despite the provision of a $380 Million federal grant to enhance technology and improve security in the 2018 midterm elections, machine failures and computer malfunctions again plagued polling places (in GA, PA, NY, IN, TX, and MA), resulting in late openings, long lines, and turned-away voters. Poor ballot layouts resurfaced in Florida, resulting in nearly 25,000 missed votes and the removal of the Broward County Supervisor of Elections, due to "misfeasance, incompetence and neglect of duty." Many of the unauditable electronic voting machines have finally been replaced with paper ballot scanners, but creative State legislation (including in FL, MI and CA) has been used to thwart and prohibit hand counting, even when results fall within the range of equipment error. This talk examines some of the old and new shenanigans that we may be looking forward to in 2020, sheds light on the reasons why contrived (and avoidable) disenfranchisement continues to play a major role in American Democracy, and offers suggestions for improvement.

Bio: Rebecca Mercuri is the founder of Notable Software, Inc., where she provides cybersecurity, standards compliance, and expert witness services. Currently she is authoring a book on digital forensic investigations from the standpoint of the criminal defense. She is well-known for having provided testimony in the Bush vs. Gore election controversy, less than a month after defending her doctoral dissertation (Electronic Vote Tabulation: Checks and Balances) at the University of Pennsylvania's Engineering School. Her website on election technology at <www.notablesoftware.com/evote.html> is considered to be a primary resource and has been predictive of many of the problems and solutions in current relevance in this field. Rebecca is the Vice-Chair of the David Sarnoff Radio Club, a co-founder and Chair of the Princeton area ACM/ IEEE Computer Society, and a past Chair of the IEEE PCJS. In her spare time, she enjoys visiting lighthouses and historic antenna sites.

ED-211: Blockchain: A Solution for Supply-Chain Integrity, Jeff Stollman, RMTM, Inc.

Abstract: Talk will explain/answer: 1) Can blockchain really protect my brand? 2) How blockchain works to provide supply-chain integrity. 3) How blockchain detects counterfeit, gray-market, diluted, and substandard products in the supply chain, 4) Is blockchain a promise or a threat? And 5) How you can implement a blockchain solution.

Bio: Jeff Stollman helps clients make sense of the technology puzzle by providing perspectives on both the threats and the opportunities of technology from a variety of disciplines. He is a technologist with over three decades of experience working with a variety of technologies, helping smart people solve the 1 or 2 technology problems that elude them. As a polymath with a passion for technology and a skeptical nature, he delves deep into new technologies to uncover the "gotchas" that don't get reported by the popular media and alerts his clients to both the promise and the risks of implementing solutions that can enhance their position in their market.

ED-209: **Hacking Machine Learning models and mitigation strategies, Lurdu Kunireddy, Prudential.**

Abstract: Machine learning models are built to learn relationship from existing data and predict on new data. To generalize the learning/training process, the data is divided into training, validation and test sets; and algorithms are trained on training sets, and the error/accuracy metrics are evaluated on validation sets. Finally, to determine the overall accuracy metric, the model is evaluated on test set. Once the model's performance is in an acceptable range, they get *productionalized*. As we know hackers take advantage of smallest bugs in software programs/applications to break into systems and make the applications perform unintentional tasks. Are applications based on a Machine leaning model, more foolproof from malicious attacks; at least when their accuracy is best? The answer is a little scary. Most advanced and highly accurate models can be tricked to predict whatever you want from their responses. You can trick a model to predict a car rather a cat. In this presentation I will demonstrate this hacking methodology, and show reasons why it is possible. I will also discuss some of the risk mitigation strategies.

Bio: Lurdu Kunireddy has over 16 years of experience in enabling organizations to safeguard data. His work spans across industries such as finance, government, insurance, telecom, media and networks, and application security. Currently he is manager of Data Science within the Data Analytics team of Prudential's Customer Office. In this key role, he is responsible continuing the evolution of Prudential's Risk Assessment Models. Prior to joining Prudential, he was a Principal Data Scientist with Deutsche Bank. As part of this position, he saved approximately $50 million per annum. He also worked as a Data Analytics Consultant for NYC, a Senior Software Engineer for Comcast and NetSilica. In addition, he was an Algorithm Developer for Aztech Software. Lurdu is skilled in Machine leaning, optimization algorithms, big data analytics and more. He has MS degrees in computer science and in mathematics from the Indian Institute of Technology and the University of Hyderabad, respectively.

ED-208: Social Media Opportunities: From Intern to VP of Strategy, Don Hsu, Dominican College.

Abstract: Social Media sites are hot: Chive, Facebook, Foursquare, Google+, Instagram, Linkedin, Pinterest, Reddit, Shutterstock, Snapchat, Tumblr, Twitter, YouTube and hundreds of new ones being created every week, if not every day! You have 400 friends on Facebook, 500 followers on Twitter, 300 on Linkedin; can you monetize this friendship? Yes, you can. Companies are hiring you in Social Media as: Intern, Associate, Coordinator, Analyst, Consultant, Mobile Marketing, Client Manager, Community Manager, Relation Manager, SEO Specialist, Strategist, Director, Vice President, or CEO. Salary ranged $35,000 to $120,000 per year. Using 10001 zip code, CareerBuilder.com shows 300+ openings; Monster.com indicates 1000+ jobs; Simplyhired.com has 13,480 and Indeed.com 14,732 jobs in Social Media. Don will give you specific details on how you can join a corporation as Social Media expert.

Bio: See room, ED-208, one session earlier.

ED-207: Workshop on Building your own Digital Amateur Radio Repeater (Hotspot) for < $100, continued.

ED-206: Learn to present: The World is a Stage, Cecilia Jackson, YLDP.

Abstract: The objective of this talk is for the audience to learn how to Present and to be Original. "It is all in the presentation." How many times have you heard that? Cecilia Jackson is here to interact with you to bring out the Broadway Star in you. Overcome your fear to be Original. "The show must go on!" At the end of this tutorial: You will learn *Presentation* techniques with Slideshows, *Body* Language, *Vocal Variety* and to be *Bold* about your ideas.

Bio: Cecilia Jackson, is the Executive Director of the Youth Leadership Development Program (YLDP) that teaches Public Speaking Skills, Mindfulness, LEAN Six Sigma Process Management and Leadership Skills to school age children. The mission of YLDP is to develop our youth's talents and leadership skills for the workforce and community leadership. As an SAP HR Technologist, she has experience in facilitating communication between technical support teams and management/business owners. YLDP strives to help bridge the communication gap by training our future workforce in storytelling and presentation techniques. Cecilia has an undergraduate degrees from Stella Maris College in Chennai India, education HR Management from Cornell University and Entrepreneurship Studies from Wharton.

ED-113: Building Computer Systems for the Internet of Things (IoT) using Arduino, Evan Williams, Web consultant.

Abstract: Evan Williams has found Arduino to be the best toolkit for the smart things he builds. The computer hobbyist who attends TCF are generally most interested in practical applications of IOT. They are aware of, may have programmed and used an Arduino microcontroller unit or a Raspberry Pi Small Board Computer. But, IoT, in which actual devices can *reorder* their world, such as a refrigerator that can automatically restock itself, or a weather station that reports back on its status, is still new. This presentation will show how to enable embedded devices to send and receive information and instructions, and make decisions themselves. Evan has on-the-job experience with LInux and Unix and has built a portable hotspot called "LocalPOD."

Bio: Evan Jan Williams began his career in 10th Grade at Princeton University's Microprocessor Lab run by the Department of Mechanical and Aerospace Engineering. This laboratory taught students how to interface 8-bit computers to real-world devices. After graduating with a degree in Literature from Thomas Edison State College, he worked for 25 years in Computer Software and Servers. After spending 10 years developing websites, his career came full circle at AT&T Middletown, where he worked on three large web dashboard projects. He also holds a degree from Rutgers University in Computer Science. He likes to bicycle and garden and in addition to enjoying writing and photography is a HAM Radio operator.

ED-110: Getting Started With Deep Learning, Larry Pearlstein, TCNJ.

Abstract: This talk will provide an introduction to Deep Learning and its relation to Artificial Intelligence (AI). I will start with a very brief overview of

neural networks, and the concepts involved in convolutional networks. We will highlight some of the most popular network architectures and training strategies for image classification, and provide examples how to realize these in various frameworks. Finally, I will demonstrate how to use popular tools such as Caffe, MXNet, DIGITS, and Tensorflow.
Bio: Larry Pearlstein is a Prof. of Electrical and Computer Engineering at The College of New Jersey. He teaches courses in embedded systems, digital signal processing, video compression and deep learning. His primary research area involves the use of deep learning for robotic vision. He also performs research in video processing, video compression and mobile embedded systems. Prior to joining TCNJ he was a Technical Director for Broadcom, where he architected chips for digital television sets. He served as Chairman of the ATSC Specialists Group on Video Coding, which helped develop the ATSC Digital Television Standard. Larry received a BSEE degree from Drexel University, and MS and PhD degrees from Princeton University. He is a Senior Member of the IEEE.

ED-109: OpenVPN for WiFi Hotspot Security, Doug Ferguson, DellEMC.
Abstract: How to setup and use an OpenVPN to provide security in an open WiFi hotspot like a hotel or coffee shop. You can also get access back your home network. We'll cover setup and use while using off the shelf routers and software based solutions.

Bio: Doug Ferguson is a Senior Advisor and support engineer for converged infrastructure products at DellEMC. He is a graduate of Rutgers University College of Engineering. He is also a computer hobbyist who loves learning about new technologies. Having taught himself to program in high school, he continues to explore numerous areas of computers including video editing, web design, visualization, and robotics. He is the "Network Czar" of his local church. Doug is a radio ham (KB2JMG), and has been a presenter at TCF since 2002!

ED-107: Arduino Workshop, Continued.

ED-105: Pythonic Object Oriented Development, Chuck Knight, ExxonMobil Research.
Abstract: Object-Oriented Programming is a widely used concept to write powerful applications in many languages. In this talk I'll tackle the basics of Object-Oriented Programming in Python: exploring classes, objects, instance methods, attributes and much more!
Bio: See previous talk.

ED-204: Lockpick Village, Continued.

***********2:35 pm to 3:30 pm***********

ED-115: Advances in Wireless and Cellular Security, Joe Jesson; RFSigint, Able Devices, Assurenet and E/CE Dept. TCNJ.
Abstract: Joe will present the latest technology applied wireless security and will show the many methods and tools applied to automobiles, aircraft digital ACARS, ship AIS, video monitors, military, cellphones (IMSI catching and tracking), satellites, WiFi and Bluetooth data interception, modulation identification and demodulation and decoding. Signal processing software will be defined; and radio (SDR) visual languages discussed and demoed including GNURadio Companion, MATLAB communications and signal processing toolboxes and Python SCIPY libraries. New inexpensive SDR hardware, e.g. ADALM-PLUTO and Lime SDR, will be on hand to illustrate the power now in the hands of data scientists; and a very cool demo of how to easily bypass the great Chinese internet firewall, and to freely access and demodulate signals in the local wireless spectrum from anywhere in the world. This last demo is a must see and my students at a summer 2017 University of Indiana summer security workshop (NSA-sponsored) loved this participatory live demo!
Bio: Joe Jesson, is CEO of RFSigint, a Wireless Sensor Patent Advisory Company, and Chief Technology Officer of Able Devices and Assurenet, wireless telematics/IoT companies. Joe has 25+ years of experience in designing and implementing - through production - Telematics, M2M, and IoT wireless sensors & embedded systems and was awarded General Electric's top Innovation prize, the Edison Award, in 2007. Joe was awarded over 15 patents and worked on the original TEMPEST signals intelligence program in the 70's. He has been a TCNJ Adjunct Electrical Engineering Lecturer since 2013, IEEE Princeton Life Chair, holds graduate degrees from DePaul University in Chicago, and currently completing a DSc doctoral dissertation at NJCU.

ED-211: Getting Hit by an 18-Wheeler: Privacy & Anonymity in the Modern Age, Cody Hofstetter, IT/Cybersecurity firm.
Abstract: With ever increasing levels of powerful Nation-state and corporate surveillance becoming commonplace, how much privacy does an individual have left? Do privacy and anonymity still exist at all? In this talk, I'll cover a brief overview of current tracking methodology followed by useful tools and techniques you can begin using immediately. I'll touch upon proxy chains, VPNs, encrypted DNS queries, setting up your own DNS nameservers, TOR, local CDN redirection, and more. If you think encryption is hard, I'll also cover how to get you started using encrypted containers with Veracrypt in under 5 minutes.
Bio: See room ED-208 at 10:15 am.

ED-209:

ED-208: The Hacking Methodology, Randall Cole, Vertical Screen.
Abstract: The purpose of this lecture is to give people a hacker defense attitude by understanding the mythology used to compromise systems. This lecture would include a live demonstration interwoven into the lecture. The demo would be in a non-network connected virtual environment.
Bio: Randall Cole is Vice President of Information Technology for Vertical Screen, a background check company. He has been in IT for more than 20 years, specializes in enterprise networking and security, and has managed all aspects of an IT department. He is a Microsoft CSE, CPMP, ITIL Certified, CISSP and CEH. Randall has an MS in Information Science from Pennsylvania State University and a Bachelor's degree from Temple University. He is an adjunct instructor for Gwynedd Mercy University, teaching Computer networking and security. He has also competed for the last ten years in various competitive hacking contests at DEF CON, as well as a volunteer for the convention.

ED-207: Small Station Earth-Moon-Earth (EME) Communication with Digital Techniques, Allen Katz, TCNJ and Linearizer Technology, Inc.
Abstract: The general public (and most hams) think it takes huge antennas and high power to communicate using the Moon as a passive reflector. This type of communications is referred to as EME for Earth-Moon-Earth. This talk will focus on the 1296 MHz and above amateur radio bands; and try to change this impression by showing examples of how little it take to make QSOs off the Moon using new digital techniques. It really does not take much more than a single yagi, a transceiver and a laptop. The addition of a 100 W *brick* and a preamp makes it easy.
Bio: Allen Katz is a Prof. of E/CE at TCNJ. He has more than 25 years of experience in the microwave and satellite industries. He received a DSc and BS degrees in EE from NJIT and an MSEE from Rutgers University. He is founder and President of Linearizer Technology, Inc, Linear Photonics, LLC and Linear Space Technology, LLC. Al is a Fellow of the IEEE and a past Microwave Society Distinguished Lecturer. He holds 17 patents, has written more than 150 technical papers; and has received numerous awards for his technical contributions. He is also a radio amateur, K2UYH.

ED-206: Electronics Manufacturers in the Computer Age: The Fates of General Electric and RCA, Florencia Pierri, The Sarnoff Collection, TCNJ.
Abstract: When commercial computing began to come of age in the late 1940s and early 1950s, it seemed that large, established electronics manufacturers such as General Electric and RCA would come to dominate the business. They were already well-accustomed to manufacturing and selling high-cost electronic equipment, and they were much larger and profitable than business machine manufacturers such as IBM or NCR. However, in the next few decades, this proved not to be the case. This talk will trace the history and ultimate demise of the computer divisions of GE and RCA, and show how each company's decision to leave the computer business shaped the future trajectory of each company.
Bio: Florencia Pierri is a historian of science and technology, and the curator at the Sarnoff Collection at The College of New Jersey.

ED-113: Introduction to Switch Mode Power Supplies, Manuel Blanco, ITW.
Abstract: All electronic devices require a power supply. The electronics industry is consistently evolving to make these devices more miniaturized, efficient and customizable. The power engines that drive them are also becoming more integrated and embedded in virtually all applications. This presentation will explore and introduce the fundamentals of switch mode power supply design and its variant topologies through the historical developments of this technology.
Bio: Manuel C. Blanco is a Sr. Electrical Design Engineer at ITW where he develops and directs new strategic product designs initiatives, and market design requests that directly impacts his company's portfolio. He has a B.S. in Physics from Seton Hall University, and both a BS and MS in Electrical Engineering from NJIT. He is a senior member of the IEEE and active in its Power Electronics and Industrial Electronics societies.

ED-110: How to Begin Being Mistrusted by Society: Getting Started With Drones, Mike Kazigian and Michael Pagan, Red Hat Inc.
Abstract: It's fun! It's the latest thing! People will look at you sideways and wonder who you are spying on! This presentation will cover the basics of what you need to get started flying drones. Key drone technologies, feature selection, laws, and a survey of types of hobbyist drones will be covered. If the venue is large enough, we will do some indoor flying.
Bios: Mike Kazigian has been an RF Engineer for a national wireless carrier for over 28 years, a licensed Amateur Radio operator since 1982, and has been flying quadcopters for over 4 years. Mike Pagan is a Sr. Solutions Architect for

Red Hat Inc., and previously spent over two decades as a Principal Architect at Hewlett Packard. He has been a home-brew computer builder since 1994 and has been flying drones since 2017.

ED-109: Blockchain: What makes it work?, Barry Burd, Drew University.
Abstract: Using Blockchain technology, you can store data in a way that prevents unwanted modifications. Blockchain is the secret sauce in Bitcoin, but it also affords organizations the ability to keep track of ongoing transactions, and insure that records are never changed by malicious hackers. In this talk, I'll explain the mechanisms underlying Blockchain. For those who enjoy dealing with code, I'll step through a small Blockchain programming example.
Bio: See talk at 10:15 am in this room.

ED-107: Free & cheap computer classes, Clarke Walker, Princeton PCUG.
Abstract: During this session Clarke will talk about free and cheap computer classes in the Central NJ area and relevant web sites. And he will list some of the local computer groups that will be of interest to those wanting to meet with other computer learners.
Bio: Clarke has been President of the Princeton PCUG (www.ppcug-nj.org) for over 15 years. He is a VP and Instructor at the Computer Learning Center in Ewing, NJ (http://clcewing.org/). Prior to this Clarke was a Technology Consultant at Digital Equipment Corporation and Compaq. Clarke earned a MS in Computer Science from Stevens Institute of Technology and a BS in Electrical Engineering from Lafayette College. He is a forever learner who enjoys sharing his knowledge.

ED-105: Using Design Patterns in Java Application Development, Michael Redlich, ExxonMobil Research.
Abstract: Design patterns are recurring solutions to software design problems that are repeatedly found in real-world application development. Design patterns are about design and interaction of objects, as well as providing a communication platform concerning elegant, reusable solutions to commonly encountered programming challenges. The most widely recognized book on design patterns, "*Design Patterns – Elements of Reusable Object-Oriented Software*," written by Erich Gamma, Richard Helm, Ralph Johnson, and John Vlissides, affectionately known as the "Gang-of-Four" (GoF), defined 23 design patterns and classified them into three categories: creational (abstracts the instantiation process), structural (groups objects into larger structures), and behavioral (defines better communication among objects). This presentation will feature an introduction to design patterns followed by detailed overviews of a pattern from each of the three design pattern categories: 1) Factory Method (creational category), 2) Decorator (structural category), 3) Observer (behavioral category). This seminar will provide an overview of all three design patterns including a description of the pattern, how and why it is used, and a source code review of a small application using the pattern.
Bio: See first talk in this room.

*******3:40 pm to 4:35 pm*******

ED-115: KEYNOTE: Tony Sager, Senior VP and Chief Evangelist, CIS.
Tony Sager is a Senior Vice President and Chief Evangelist for CIS (The Center for Internet Security). He leads the development of the CIS Controls, a worldwide consensus project to find and support technical best practices in cybersecurity. Tony also serves as the Director of the SANS Innovation Center, a subsidiary of The SANS Institute.
Tony retired from the National Security Agency (NSA) after 34 years as an Information Assurance professional. He started his career in the Communications Security (COMSEC) Intern Program, and worked as a mathematical cryptographer and a software vulnerability analyst. In 2001, Tony led the release of NSA security guidance to the public. He also expanded the NSA's role in the development of open standards for security.
We are fortunate to have Tony bring his expertise and vision to TCF 2019 on this critical topic, and we are excited to have him join us!

*******9:30 am to 3:00 pm Poster Presentations *******

ED Second Floor Lobby: Hearing Aid Device for Pets by Albert Martin*, Pooja Paidipalli and Rebecca Korovin*, TCNJ students.
Abstract: Dogs are susceptible to hearing loss, which can cause a serious safety concern, especially when off their leash. The average cost of a hearing aid for a dog ranges between approximately $3,000 to $5,000. It is, therefore, an expensive investment. In addition, the available hearing aids for pets appear to only amplify sounds and are not useful for pets that are completely deaf. The hearing aid that is being developed will be cost-effective and will allow pets suffering from all variations of deafness to be aware of their surroundings by converting sound to vibration. It will respond to sounds over a frequency range from 100 Hz to 24 kHz that exceed a level of 75 dBsl. The hearing aid will be mounted on a vest to be worn by the pet along with small motors that will vibrate proportionally to sound inputs from microphones mounted on the vest.
Bio: Albert Martin **i**s an Engineering Science, Engineering Management major at TCNJ. He has interned at Schneider Electric in Horsham, PA. His interests include artificial intelligence and embedded systems. Rebecca Korovin is a senior Engineering Science, Engineering Management major at TCNJ. She has interned at Consolidated Edison, Inc. in NYC and the NASA Langley Research Center in Hampton, VA. Her interests include power engineering with a focus on sustainability and green energy.

ED Second Floor Lobby: Basic Graphics Processing Unit, Patrick Hansen, Jeffrey Sabo, and Skyler Maxwell*, TCNJ Students.
Abstract: Graphics processing units (GPU) are necessary for any device with a display including personal computers, smartphones, and embedded systems. The graphic engine of a device is hardware that generates and sends video data to a display. This project includes the design and implementation of a graphic engine on a field programmable gate array (FPGA) to drive a display via the video graphics array (VGA) interface. Additionally, a host device will be programmed on a programmable system on chip (PSoC) to communicate with the hardware engine and send drawing commands to the display. The system's functions will include receiving and processing commands from an outside host via the I^2C communication protocol, providing a display memory for a 640 (horizontal) by 480 (vertical) pixel display resolution, writing pixel data into display memory based on received commands, and transmitting the pixel data to a monitor via VGA protocol. Our hardware design will be represented using the Verilog hardware description language, and design verification procedures will be defined based on both Verilog simulation, and the configured FPGA board environment.
Bio: Patrick Hansen is a senior computer engineering major at TCNJ. He is doing research with Dr. Kim involving Collaborative Robotics and Intelligent Systems (CRoIS). He had an internship at Zoomi, Inc. Following graduation, he wants to work in software engineering and/or artificial intelligence. Skyler Maxwell is a senior computer engineering major at TCNJ. He is doing undergraduate research in image and video processing, and deep convolutional neural networks, and computer vision. He has interned at the Air Force Research Labs and S&C Electric Inc. He hopes to pursue software engineering focusing on image/video processing applications after graduation. Jeffrey Sabo is a TCNJ senior year studying computer engineering. He has done research with Dr. Adegbege, and has published a paper on Embedded Applications of Model Predictive Control. His interests lie in optimal control and embedded systems and is seeking a full-time position in embedded systems/software engineering.

ED Second Floor Lobby: Autonomous Car with Android Based Control by Brendan Behrens*, Richard Bustamante, Madison Mastroberte and Terrence Skibik, TCNJ Students.
Abstract: As demand increases for completely autonomous vehicles, new methods for navigation and safety need to be investigated to determine a viable solution. The team is currently building and modeling a small-scale car to explore real-time control application. The project is intended to illustrate the behavior of an autonomous vehicle with a unique obstacle avoidance algorithm to navigate an unforeseen environment. The team is designing and building an autonomous car that is capable of following a predetermined route and adapting to avoid unforeseen obstacles. This system consists of an Android phone, Android application, Raspberry Pi, and Arduino. The Android phone serves as the application environment, a front-end user interface with the system. The on-phone application receives video feedback from the car and the team is currently in the process of developing controls (direction, speed and manual override). The Raspberry Pi processes video and broadcasts this live video stream to the Android device. The Arduino provides a node for sensor readings that are sent to the Raspberry Pi and Android phone for processing. This project simulates the methodologies being investigated in the field of autonomous systems.
Bio: Brendan Behrens* is a senior Computer Engineering major at TCNJ. His current interests are in data science and security as well as software development and embedded systems. After graduation he will work STEALTHbits Technologies. Richard Bustamante is a senior Computer Engineering major at TCNJ. He is IEEE Student Branch treasurer. His interests include mobile app development, data science, and software development; and after graduation is interested in working in app development. Madison Mastroberte is a senior Electrical Engineering major at TCJ. She is IEEE Student Branch VP. Her interests are in data science and machine learning. After graduation, she will be joining Bloomberg L.P.

ED Second Floor Lobby: PSoC Transistor Curve Tracer and RCL Meter by Jacob Thomas*, Kasey Hill* and Steven Andresen, TCNJ Students
Abstract: This presentation describes the construct a semiconductor curve tracer that measures N/P MOSFET and NPN/PNP BJT devices. The hardware driver for the curve tracer consist of two individual circuits, one for NPN/NMOS and one for PNP/PMOS devices. An inexpensive Cypress PSoC 5LP prototyping kit is used to interface with the hardware, find threshold voltages and produce the necessary drain/collector and gate/base voltages. The PSoC microcontroller also drives a full color touchscreen display for user control and display of the semiconductor voltage-current curves. Device voltage-current measurements may be saved in a CSV file on a microSD card. We hope that our

low-cost curve tracer can be used for educational purposes in laboratory exercises and projects.

Bio: Steven Andresen is a senior electrical engineering major at TCNJ. Last summer, he interned at HAE Innovations where did package and thermal engineering, software development and embedded design. Kasey Hill is a senior computer engineering major at TCNJ from Bucks County, PA. He interned in information technology for Central Bucks School District. Jacob Thomas is a senior electrical engineering student at TCNJ. Last summer he interned at Mini-Circuits Incorporated where he stress-tested various radio frequency components.

ED Second Floor Lobby: Pulsar Receiver, Jacob Levine*, TCNJ Student

Abstract: Pulsars, quickly rotating neutron stars that emit "pulses" of electromagnetic radiation, were discovered at Cambridge in the 1960's. The original detection required 4096 dipole antennas covering 4 acres and some of the brightest minds that astronomy had to offer. However, modern advancements in technology have reduced the barrier to entry for enthusiasts who wish to observe these astronomical phenomena. Utilizing off the shelf, hardware and a 28' dish, this project demonstrates and improves upon the process of detecting these remnants of supernova, so that even those without years of experience or education can enjoy this part of radio astronomy.

Bio: Jacob Levine is a senior Computer Engineering major at TCNJ. Hi professional interests include networking architecture, cloud computing, virtualization, and other related technologies.

ED Second Floor Lobby: Microwave Energy Harvester, Kyle Burnore* and Patrick Stefanacci*, TCNJ Students.

Abstract: The groups task is to design and fabricate a wearable rectenna that can harvest a power density ranging from 1μW/cm² to 10μW/cm² at 2.45 GHz on inexpensive materials. The constraints of the rectenna are a weight < 50 grams, and the thickness has to be < 8 mm. The initial prototype is made from contact paper using silver paint for the traces. The rectenna will consist of a an array of patch antennas. Our goal is to compete in the IMS Boston Student Design Competition.

Bio: Kyle Burnore is a TCNJ electrical engineering major. Last summer, he was an intern at Lockheed Martin where he tested and evaluated different system requirements. Patrick Stefanacci is also a TCNJ electrical engineering major. He is currently involved in a TCNJ research project with Tenna to development low-power sensor devices for tracking temporary construction assets.

Sarnoff Collection Open 12:30-5:00 PM, tours 12:30 & 4:35 RWH 2nd Floor

The Sarnoff Collection was originally established by RCA in 1967 as the David Sarnoff Library. Over the decades, the collection grew to include a museum, archives and library. The collection, which comprises > 6,000 artifacts related to the major developments in communication during the 20th century, was donated to TCNJ in 2010. At the same time the library and archival holdings, including Sarnoff's papers and memorabilia; 25,000 photographs; and thousands of notebooks, reports, and publications related to the histories of RCA and its Labs, were transferred to the Hagley Museum and Library in Wilmington, DE. The collection at TCNJ includes artifacts related to David Sarnoff's life; RCA, NBC, Victor Talking Machine Company, and Marconi Wireless Telegraph Company; the history of radio, TV, broadcasting, audio & video recording, electron microscopy, radar, vacuum tubes, transistors/semiconductors, lasers, liquid-crystal displays, ICs, microprocessors, computers, communications satellites, and other technologies RCA played a major role in inventing and developing; and some of the many people, beside Sarnoff, who made these technologies work. The research, cataloguing, and imaging of the collection is an ongoing project. The information in our database is available through our website, which is continuously updated as new or expanded information becomes available.

Subject to last minute changes as we do

Saturday	ED-115 Cyber Security	ED-211 Entrepreneurship & Bus.	ED-209 IT-PC	ED-208 Social Media & Apps	ED-207 History & Technology	ED-206 Education & STEM	ED-113 Technology & Robotics	ED-110 Microsoft & Trends	ED-109 Software/ App Dev.	ED-107 Arduino & Software	ED-105 OOP University	ED-103 Amateur Radio	ED & RWH Exhibits
10:15am to 11:15am	How to be Safe in Cyberspace T. Kenny	Introduction to Ghost & other Home Cutting Machines B. Bell	Windows Bootcamp L. Jacks	Want to be a Super Spy C. Rimmler	The Space Shuttle Computer Systems F. Cilmer	Learn How to Solder J. Allar		Satellite Amateur Radio Communications Today G. Gaeta	Quantum Computing and Beyond A. Burr	Hands-On Arduino Workshop for Beginners Conducted by K. Fritz (Limited Space, Bring Your Laptop Load Free Arduino Software before attending: www.arduino.cc/en/Main/Software)	Introduction to OOP Design Principles M. Rachlin	Ham Cram 101 Ham Radio License Exam Preparation Cram Course Ham Cram Session begins at 9:00am and goes to 12:30pm Practice Exam given at 1:30pm Walk-in Real Exam given at 3:40pm Conducted by the David Sarnoff Radio Club www.n2re.org	There is in Room ED-207 at 11:20am Lockpick Village Workshop on How to Pick Locks, Repeated Hourly in Room ED-206 Poster Presentations Digital Photo Exhibit Vintage Computers Club/Org Tables Tour the Sarnoff Museum of Historic Technology (1pm-3pm in ED-Tech Floor)
11:25am to 12:15pm	State of Cybercrime in New Jersey AUDIO	Workshop: How to Write Proposals and Requirements B. Beerbaum	Windows Bootcamp L. Jacks	Edit Game Development in Unity Jersey S. Marshall	Cybercrime and Theater in Zen K. Rieser	Cutting Edge Web & Digital Connectivity in 2019 F. Kaplan	Introduction to Robotics and the Robotics Pavilion S. Kim	Stock Market Timing Using Neural Networks P. Patsiokas	Raspberry PI and IOT B. Brucciani		Getting Started with Java M. Rachlin		
12:25pm to 1:20pm	Cybersecurity Issues for Dances D. Schaefer & P. Chen		Explicit Embedded Programming B. Wang	Internet Job Hunting D. Hsu	Workshop: Build a Ham Radio Digital (Repeater) Hotspot for < $100 J. Aguero	Flying Around the World, to Mt. Polo & More in a Small Plane M. Bell	New Hardware to Accelerate DSP and Graphics J. Bakos	Security Features of Windows 10 B. Bell	Develop Apps for iPhone & Android with Flutter B. Burd		Introduction to Python G. Knight		
1:30pm to 2:25pm	A 2020 Vision of U.S. Election Security R. Wenzel	Blockchain: A Solution for Supply-chain Integrity J. Dobbins	Hacking Machine Learning & Mitigation Strategies L. Kennedy	Social Media Opportunities From Intern to VP D. Hsu		Learn to Present The World is a Stage C. Jackson	Building Computer Systems for IoT using the Arduino E. Wilson	Getting Started in Deep Learning L. Pavlovic	OpenVPN B. Fergason		Pythonic Object-Oriented Development G. Knight		
2:35pm to 3:30pm	Advances in Wireless and Cellular Security J. Jacobs	Privacy & Anonymity in the Modern Age C. Hrivnak		The Hacking Methodology R. Cole	Earth Moon Earth (EME) Communication with Digital Technologies A. Kaul	The Roles of CE & RCA Electronics Manufacturing in the Comp. Age F. Root	Introduction to Switching-mode Power Supplies W. Bosco	Getting Started with Drones W. Kaczkan & W. Pugar	Blockchain: What makes it Work? B. Burd		Using Design Patterns in Java Application Development M. Rachlin		
3:40pm to 4:35pm	*Featured Keynote Speaker:* Tony Sager, Senior VP and Chief Evangelist of The Center for Internet Security, will talk on "*Never Say Anything*: The Education of a Cybergeek" in Room ED-115												

ED = New Education Building RWH = Roscoe West Hall

WiFi Connect: SSID: Welcome-to-TCNJ. Click Link Under "TCNJ Guests", Enter Info, Click on Register, Use given Password.