46th Annual
Trenton Computer Festival
The Oldest Personal Computer Show in the World
The College of New Jersey
This Year a Virtual Event on Zoom

2022 PROGRAM

Talks & Forums **Saturday, March 19 - 9:00 am to 5:00 pm** **Talks/Forums start at 10:15 am**	**ADMISSION IS FREE**. EVERYONE WELCOME Students to Expert IT Professionals www.TCF-NJ.ORG

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NYACC – New York Amateur Computer Club – www.nyacc.org
ACGNJ – Amateur Computer Group of New Jersey – www.acgnj.org
GSJUG – Garden State Java User Group – www.gsjug.org
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TCF Keynote Speaker
Prof. Bob Kopp, Rutgers University:
Co-Director, Climate Impact Lab;
Co-Author, UN IPCC Climate Report;
speaking on *"Climate, Technology and Democracy"*
3:40 pm in Track-1

********* Keynote Event: Climate, Technology and Democracy **********

Robert Kopp is a climate scientist who serves at Rutgers University as a professor in the Department of Earth & Planetary Sciences and as co-director of the University Office of Climate Action.

Professor Kopp's research focuses on understanding uncertainty in past and future climate change, with major emphases on sea-level change, the interactions between physical climate change and the economy, and the use of climate risk information to inform decision making. He directs the Megalopolitan Coastal Transformation Hub (MACH), a National Science Foundation-funded, 12-university consortium led by Rutgers that works within the Philadelphia-New York City-New Jersey region to both 1) facilitate flexible, equitable, and robust multidecadal planning to manage climate risk, and 2) advance the scientific understanding of how interactions among coastal climate hazards, changing landforms, and human decisions shape climate risk. He is also a director of the Climate Impact Lab, a multi-institutional collaboration of more than three dozen economists, data scientists, climate scientists, and policy experts, working to bring Big Data approaches to the assessment of the economic risks of climate change.

Professor Kopp is a lead author of the Intergovernmental Panel on Climate Change's 2021 Sixth Assessment Report, the U.S. Global Change Research Program's 2017 Fourth National Climate Assessment and the 2015 book Economic Risks of Climate Change: An American Prospectus. From 2017-2021, Professor Kopp served as director of the Rutgers Institute of Earth, Ocean, and Atmospheric Sciences (EOAS).

Professor Kopp is a fellow of the American Geophysical Union, and a past Leopold Leadership Fellow and a recipient of the American Geophysical Union's James B. Macelwane and William Gilbert Medals.

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

T-1: Science Informing Environmental Policy, Katrina "Kati" Angarone, NJ Department of Environmental Protection (NJ DEP)

Abstract: Katrina Angarone will bring together a panel from NJDEP to discuss Science and Policymaking. The panel will consist of Nick Procopio, Ph.D., Manager, Division of Science and Research to addressing New Jersey Climate Science; Mike Russell, Environmental Economist to addressing Understanding Climate Risk; Nick Angarone, Manager, Bureau of Climate Resilience Planning to address Climate Science in Action.

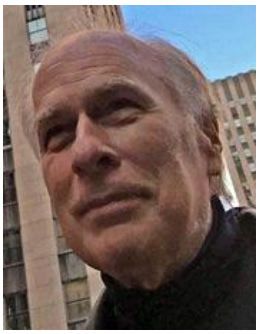
Bio: With twenty plus years of policy experience at the New Jersey Department of Environmental Protection, Kati brings the foundation of sound science together with policy development to guide the implementation of various environmental and public health policy initiatives. As the Associate Commissioner of Science & Policy, she ensures policy cohesion across the Department in furtherance of the Department priorities (e.g., Climate, Water and Public Health). She also oversees the Division of Science & Research, which provides scientific support to programs within the Department. In addition, her office includes the Offices of Environmental Public Health & Safety and the Office of Economic Analysis, which work closely with the Department of Health on environmental public health issues and provide support for economic analyses performed during policy development, respectively.

T-2: The Promise of Solar Energy, Jonathan Allen, RF Electronics Consulting

Abstract: We will begin with a brief review of photovoltaic theory, and the history of solar power. The main discussion will describe the evolving state of the art, including the dramatically decreasing costs of PV systems and the promising new technologies which will continue to advance solar power in the critical years to come.

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 nine years, Jonathan has worked as a volunteer restoring and documenting the Sarnoff Collection at TCNJ.

T-3: How Computing is Changing Photography, Louis J. Judice, The Round Mountain Group, LLC



Abstract: From artificial intelligence to non-fungible tokens, you almost need a computer science degree to take a photograph today! Not really!! In fact, from phones to high end cameras, high tech is making it easier than ever to shoot awesome images. We break it down with lots of live, hands-on demos - what could go wrong??

Bio: Louis Judice is a lifelong photography enthusiast and owner and technical lead of the Round Mountain Group - voted northern Hunterdon's best web agency in 2019, 2020 and 2021. Previously at HP, he was a mobile internet pioneer - his team launched the world's first public mobile website in Geneva in 1999. He has held management, engineering, consulting and marketing roles at HP, DEC, GE and RCA Labs. Judice received the BE degree in electrical engineering from Manhattan College, and is a member of the IEEE and of the TCF Steering Committee. He is also a life member of the Hunterdon County Historical Society and was named a "Guardian of History" by the Red Mill Museum Village in 2020. Judice is the former Mayor of Bethlehem Township, NJ and is currently moderator of the township's virtual meetings. His website is at https://louisjudice.com.

T-4: Communicating for Climate Change-Challenges, Holly Caggiano and Sonya Ahamed, Princeton University / Michigan Technological University

Abstract: To achieve climate change mitigation efforts, national net-zero goals depend on end-use electrification and widespread adoption of energy efficient technology by households. How can we effectively communicate the need for energy efficient and renewables technology in the household and beyond? What will encourage stakeholder buy-in to spark widespread adoption and support of these technologies? This panel will draw on recent social science research to address questions around green technology adoption and behavior change.

Bio: Holly is a Distinguished Postdoctoral Fellow at Princeton University's Andlinger Center for Energy and the Environment. Her research explores social dimensions of the renewable energy transition in the US. Her current work investigates how diverse stakeholder groups form coalitions to advocate for energy systems change. This work connects patterns across decision-making scales, exploring the ways individual decision-making influences collective action and how collective action disrupts existing relations of power in local energy politics. Drawing from an interdisciplinary social science background, her work critically evaluates both top-down and bottom-up approaches that aim to advance equitable climate change mitigation & adaptation efforts.

Sonya is currently a postdoctoral researcher investigating the impacts of COVID-19 on energy, water, and food consumption at Michigan Technological University. She has a lifelong fascination with the concept of energy in its multiple and varied manifestations, and values the opportunity to think about the implications of energy systems together with students in real-world settings. She holds a doctorate in Natural Resources from the University of Vermont, where she was a PhD Fellow in the National Science Foundation's multidisciplinary program "Smart Grid – Technology, Human Behavior and Policy" and was a visiting professional at the National Renewable Energy Laboratory. Her doctoral research examined hydraulic fracturing in the Denver Region, hydropower in Eeyou Istchee/Northern Quebec, and analyzed the global fossil fuel production network. Sonya also spent a decade as a researcher at the Center for International Earth Science Information Network at The Earth Institute at Columbia University, where she was one of the Principal Investigators for a project to digitally map soil properties worldwide, focusing on Africa South of the Sahara. She has taught courses, mentored students, facilitated, and lectured in energy systems transitions, race and culture in natural resources, the food-energy-water nexus, offshore wind, and deforestation linked to big hydro, among other topics.

T-5: Clean Energy Design using Computer Aided Engineering (CAE) Simulation, Sharan Kalwani, DataSwing LLC

Abstract: High Performance Computing (HPC) has come a long way from weather forecasting to now advanced design & predictions about many physical phenomena. A lot of this became possible thru giant strides in computer calculation power, connection capability as well as improved scientific models and extensive simulation supporting software. In this talk we will first get introduced to everything about HPC, and how it is used for weather and climate modeling. We will then learn how energy engineering designs are now being accelerated using simulations, and all this is now being combined with ever growing data plus expert domain knowledge. Using this, we can now employ this design much better for cleaner energy solutions, and its long-term positive impact on our world. We will then share a few modern day, real-world examples of this from different parts of the world.

Bio: Sharan Kalwani is an industry technology specialist with over 25+ years of experience. He has degrees in both Engineering and Computer Science. He has worked in many diverse areas. Sharan is a senior member of IEEE and participates in the IEEE Computer/Education/Power Energy and Vehicle Tech Societies respectively. He is also a member of SAE and ASME, is an emeritus member of Michigan!/user group (mug.org), the oldest of the *NIX user groups based in Michigan (1985). He enjoys teaching, holds an Adjunct Faculty position at several local educational institutions. He also serves on the advisory board for the Computer Science Department at Loyola University-Chicago. Sharan has published one book "Linux and Internet Security", and is now working on his second. He is a recipient of the IEEE MGA Achievement award for his contributions to IEEE activities in 2018. Recently in January 2022, he was awarded the IEEE Region 4 Jack Sherman Outstanding Member award for 2021.

T-6: Climate Literacy and Empowerment: a Catalyst, Frank Niepold, NOAA

Abstract: States, cities, Tribal Nations, national non-profits, community-based organizations, networks and private companies have committed themselves to finding and implementing climate solutions. Likewise, numerous initiatives and programs by federal and subnational governments have made substantial progress toward building understanding and capacity to respond to climate change within various sectors of society. Climate literacy and empowerment is a catalyst for sustained, equitable, society-wide elidable climate action. Reducing vulnerability to climate and preparing for just transitions to a low-carbon economy are critical for societies, particularly in frontline communities. Coordinated systems of education, engagement, workforce development, and training can support learning to create stronger communities, thus empowering people to implement the transition to low-carbon and resilient communities. Improving learning about Earth's complex climate and energy system is fundamental to support development of mitigation and adaptation strategies. This session provides opportunities for the growing efforts to explore these intersectional community initiatives and to showcase their work and share information,

models, and new program designs in order to support session participants in taking action within their own communities and organizations.

Bio: Frank Niepold is the Senior Climate Education Coordinator at NOAA's Climate Program Office (CPO) in Silver Spring Maryland, co-manage the NOAA CPO Communication, Education and Engagement Division, Climate.gov Education section lead, a co-chair of the U.S. Global Change Research Program's Education Interagency Working Group, the U.S. National Communications Report chapter lead on Education, Engagement, Training, and Workforce Development for the U.N. Framework Convention on Climate Change (UNFCCC). Frank was the action for Climate Empowerment National Focal Point for the United States, founding member of the CLEAN Network and co-chair of the CLEAN Network Leadership Board, a member of the Federal Steering Committee for the Fourth National Climate Assessment (NCA4), and federal lead for the White House Climate Education and Literacy Initiative (2013-2016). At NOAA, he develops and implements NOAA's Climate goal education and outreach efforts that specifically relate to NOAA's Climate goal and literacy objective. Frank is the "Teaching Climate" lead for NOAA's Climate.gov web portal that offers learning activities and curriculum materials, multi-media resources, and professional development opportunities for formal and informal educators who want to incorporate climate science into their work. Additionally, he is the managing lead of the U.S. Global Change Research Program (GCRP) document, Climate Literacy: The Essential Principles of Climate Science. NOAA, NSF, NASA, AAAS Project 2061, CIRES, American Meteorological Society, and various members from both the science and education community worked to define climate literacy in the United States.

T-7: (1) Representing Topography and Land Heterogeneity in Climate Models (Enrico Zorzetto) / (2) Critical Minerals for the Energy Transition: Challenges and Opportunities (Rachel Coyte), (1) Princeton University and NOAA GFDL / (2) Ohio State University

Abstract: (1) Land models are a fundamental component of the current generation of climate models: They simulate complex processes ranging from the evolution of plants, hydrology and soil moisture, ice and snow, and many other biogeochemical processes. Simulating these physical processes is key for adequately predicting the future evolution of surface temperature and water availability over land. However, the computing resources available to date pose limits on the resolution at which these models can run. How can we then capture the heterogeneous nature of land surfaces using a relatively coarse computer model? In this talk, I will present some techniques, which are used to solve this issue, showing how we can capture relevant information from high-resolution topography and terrain maps and account for their effect in coarser resolution models.

(2) Critical minerals (e.g., lithium, cobalt, and copper) play an important and often underappreciated role in the transition from fossil fuels to low-carbon energy sources. The acquisition and utilization of these materials present many challenges however, from the environmental and social costs of mining to questions surrounding the reliability of supply. This talk will cover why these minerals are so important, some of the difficulties involved in their extraction from the earth, as well as some opportunities for creating an energy future that is more secure, equitable, and environmentally responsible.

Bio: (1) Enrico Zorzetto is a postdoctoral researcher in Atmospheric and Oceanic Sciences at Princeton University and at the NOAA Geophysical Fluid Dynamics Laboratory. His research focuses on how the terrestrial surface exchanges energy and water with the atmosphere, and on improving the representation of these exchanges in the numerical models used for weather and climate predictions. This is done using a combination of statistical and machine learning tools, remote sensing observations, and physical models. His recent projects include i) studying the global distribution of extreme rainfall events based on satellite datasets, and ii) capturing the effect of high-resolution topography in climate models.

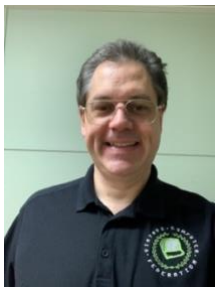
(2) Rachel M. Coyte is a postdoc at the Ohio State University working on environmental and medical geochemistry in the Water Health Energy and Environment Laboratory and the Global Water Institute. Coyte's research aims to 1) improve the understanding of fundamental research questions about sources and mechanisms that affect environmental quality using geochemical tools and 2) conduct research relevant to societal needs. Coyte has worked on groundwater quality and water-energy nexus issues across the globe, with her work on uranium in Indian groundwater winning one of the Paper of the Year Awards from Environmental Science and Technology Letters. She also uses traditional geochemistry to study environmental exposures and trace element dynamics more directly in the exposome, which links the natural environment, anthropogenic exposures, and the in vivo bioincorporation within the human body and its biominerals and tissues.

T-8: Coding with CAD for 3D Printing, Aditya Dutt, Middlesex County Academy

Abstract: We will introduce CAD and 3D printing, and show how they are changing the world of innovation. We will discuss the sustainable, recyclable, and biodegradable materials used to 3D print, which would reduce our carbon footprint. We will then move on to a step-by-step tutorial showing the attendees how they can create a 3D model on Tinkercad using basic pattern modeling with coding.

Bio: I am a High School junior at the Middlesex County Academy in Edison. I am a Computer Science and Robotics Engineering enthusiast and have been working with autonomous robots using platforms like Arduino, Raspberry Pi and custom circuits. I work part-time as a Webots instructor at Storming Robots, and am a member of their development team for the Rescue Sim Platform. I am the Founder and President of Mission: DICE where I conduct free CAD modeling workshops. Mission: DICE has received a grant from Rutgers Makerspace and they are providing free 3D printing services for students who attend my workshops.

T-9: Vintage Computer Federation (VCF): A mission of preserving computing history, Jeffrey Brace and Dean Notarnicola, VCF



Abstract: The mission of the Vintage Computer Federation (a501c3 non-profit) is: To preserve computing history through education, outreach, conservation, and restoration. We strive to accomplish this through family friendly hands-on activities at our museum, at regional and global events, and by fostering and nurturing the expansion of our on-line and in-person communities. This talk will outline the origins and history of the Vintage Computer Federation and Vintage Computer Festivals. There will also be discussion about other events that encourage the proliferation of vintage computer knowledge, camaraderie and preservation.

Bio: Jeff Brace is the Vice President of the Vintage Computer Federation, showrunner for Vintage Computer Festival East, docent manager for the Mid-Atlantic chapter, and event manager for the Mid-Atlantic chapter. He organizes the monthly repair workshop, swap meet and holiday party. Jeff Brace graduated from Drexel University with a bachelor's degree in Computer Information Systems. He worked as a database programmer for five years before becoming a Taekwondo instructor. He received 5th Dan black belt and is currently a Master Instructor in Taekwondo having taught since 2001. He received his master's degree in Elementary Education from Drexel University and is looking to become a public school teacher. His first computer was a Commodore 64 and is his favorite machine to this day.

Dean Notarnicola has been an active member of VCF for seven-plus years, initially joining because of the rekindling of his interest in all things vintage computing. As an IT Architect (formerly programmer, network and systems engineer) his career has moved him farther away from the bare metal that sparked his enthusiasm for computing back in 1979 with a TRS-80. Since then, he has been very fortunate to work with many great people who share the same passion for preserving the history of computing.

T-10: Introduction to Object-Oriented Programming and Design Principles, Michael Redlich, Garden State Java User Group (GSJUG).

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 presentation will provide an introduction to 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. An 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, New Jersey with experience in developing custom scientific and web applications. His technical expertise includes object-oriented design and analysis relational database design and development, Java, C++, Python, Matlab and other programming/scripting languages.
Mike has been an active participant in the Java community for over 20 years having facilitated the Garden State Java User Group since 2001 and writing Java news for InfoQ since 2016. He has contributed to open-source projects and serves on the leadership council of the Jakarta EE Ambassadors.

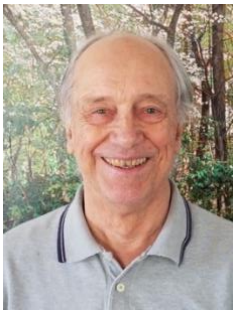
***********11:20 am to 12:15 pm***********

T-1: Metrics & Mindset to Zero Carbon: "First Gigawatt Down", Rezwan Razani, Author and Footprint to Wings (FP2W)

Abstract: Rezwan will be getting into the details about how we can use these metaphors and metrics, together with databases and user interfaces and augmented reality and other computational tools and templates, to help people get a clear sense of their options, and how to negotiate viable solutions. The sooner people get in touch with the implications of their true preferences, the sooner they will take ownership of the negotiations, and work together effectively to get to zero carbon and beyond.

Bio: Rezwan Razani is a writer, planner, game designer and the founder of Footprint to Wings (FP2W), an organization that's turning the "Race to Zero Carbon" into a national pastime. At TCF2022 she will discuss how we are doing and what we can do to win the race. See her website: https://fp2w.org and "First Gigawatt Down" video: https://youtu.be/8--VSh0JUT0].

T-2: How to Mobilize Your Town for Environmental Impact, Jon Gibbons, Candide's Garden & Friends, Inc.



Abstract: *Candide's Garden* is devoted to educating homeowners, youths, and organizations on earth-friendly landscaping and gardening, with an emphasis on native plants, wildlife, and pollinators. Serving as an extensive menu of environmental solutions, the Garden also serves as a model for a number of innovative projects being carried out to re-imagine the town as a "Distinctive Environmental Destination." Lake Como, NJ, is a ¼-mile square Borough on the Jersey Shore, with a seasonal population ranging from 1,800 to 5,000 in Summer. Our task has been to assemble volunteers, educational institutions, and public and private organizations to work in concert to migrate toward a more eco-beneficial community, with a village-type atmosphere, which should also serve as an attraction to visitors. We also employ a variety of technologies to support the projects in this Vision.

Bio: Originally from the Jersey Shore, Jon Gibbons enjoyed a varied architectural career, practicing both in England and the USA. In recent years he worked for NASA's Goddard Space Flight Center, then lastly for the Smithsonian Institution. In retirement, he now advocates for environmentally-friendly landscaping and gardening. He runs *Candide's Garden,* which provides an extensive menu of environmental solutions for homeowners, youths, and organizations. Jon also runs a multi-project program to transform his town toward a more beneficial natural and social environment. He is the Founder and President of Candide's Garden & Friends, Inc., a 501[c]3 non-profit; he chaired the Lake Como Environmental Commission from 2013 to 2019; and he is a Rutgers Master Gardener in Monmouth County. Jon was educated at Princeton University (BSCE), University of Pennsylvania (MSE), and Rhode Island School of Design (B.Arch).

T-3: Live Computer Music Concert and Workshop, Don Slepian, Electronic Music Education and Preservation Project

Abstract: Electronic keyboardist Don Slepian will play live orchestral music using his current custom assemblage of computer music instruments. As part of his lecture/demonstration he will host a discussion of modern tools and techniques in computer music performance.

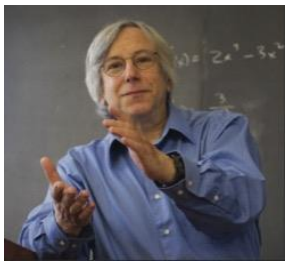
Bio: Technologist Don Slepian first presented his program at TCF 1982. He currently is a researcher at http://EMEAPP.org, the Electronic Music Education and Preservation Project.

T-4: Microsoft Tips & Tricks - Being Mindful of our Environment, Kristen Callahan, Mercer County Community College

Abstract: The average American spends 7 hours and 11 minutes of screen time per day. The majority of this time is spent on mobile devices [*from DataReportal (comparitech.com)*]. How can we be more productive while being mindful of preserving our environment? Come join the fun as we help each other learn how to take advantage of Microsoft product offerings. What are the tips and tricks you use to increase your productivity? We'll start with the basics and go from there.

Bio: Kristen Callahan has worked with business and technology for over 40 years. She held several management positions in IBM, IMS
America (a division of Dun and Bradstreet) and Peterson's. In addition, she managed her own business -- Princeton Entrepreneurial Resources, Inc. Currently, she shares her expertise with others, as a tenured professor at Mercer County Community College, where she teaches business application classes and manages several programs. Callahan has a BA from Bucknell University and MBA from Rutgers, School of Management.

T-5: Meet the World's Smallest Computer Language, Barry Burd, Drew University.



Abstract: The latest Java Language Specification document is 848 pages long. In comparison, the document describing Python is only 185 pages long. Can we go smaller? A formal description of the Unbounded Register Machine (URM) language is one or two pages long. With only three, very simple syntax rules, the URM language can describe any algorithm that can be expressed in Java, Python, or any other industrial strength language. In this talk, I introduce the URM language and challenge you to stretch URM to its limits. **Disclaimer:** The information in this talk has no practical application! URM is a fun toy, but it's not a useful programming language.

Bio: Barry Burd is a professor of Mathematics and Computer Science at Drew University in Madison, NJ. He's the author of several books, including *Java For Dummies*, *Flutter For Dummies*, and *Java Programming for Android Developers For Dummies*, all from Wiley Publishing. In 2020, he was honored to be named a Java Champion.

T-6: Interactive Simulations to Guide Learning and Action for Climate Solutions, Juliette Rooney-Varga, University of Massachusetts, Lowell

Abstract: People learn best from experience, especially when learning how to manage difficult problems. But learning from experience about climate change is learning too late. By the time we experience climate impacts, the heat-trapping gases that caused them have long been in the atmosphere. We similarly are running out of time for effective climate action. We need high-impact, scalable solutions now in order to meet international climate goals. We ask whether effective learning can come from experiencing simulations, instead of the real-world impacts of climate change. In this session, we'll use the interactive En-ROADS climate policy simulator to create a path to a sustainable climate and share how simulation-based approaches can help build consensus for effective climate action.

Bio: Juliette Rooney-Varga is an expert on climate change and sustainability. She is the Director of the Climate Change Initiative, Co-Director of the Rist Institute for Sustainability and Energy, and Professor of Environmental Science at UMass Lowell. She is also a Research Affiliate at the MIT System Dynamics Group. She has more than twenty years of experience as a scientist studying biogeochemistry and microbial ecology. Her current work focuses on translation of science to bridge the gap between scientific and societal understanding of climate change and sustainability. She develops and analyzes the impact of dynamic modeling and interactive simulations that enable people to learn for themselves about the climate and energy systems. These simulations bring current climate change and energy science to students, citizens, and policymakers at all levels and have been shown to motivate science-informed action. She earned a Ph.D. in microbiology at the University of New Hampshire, an MS in natural resources from Cornell University and a BA from Colby College in environmental biology.

T-7: The Most Important Computer You Never Heard Of, Frank O'Brien, Infoage Science Museum and NASA

Abstract: Imagine a nationwide network of computers, each housed in a building nearly the size of a city block, all interconnected with high-speed data links, radars and countless other devices. They are part of the military's system of air defense, monitoring the skies for Russian bombers heading for the United States. If a bogey is spotted heading for US airspace, a quick check of all known flight plans verifies that it is an unknown. With a few clicks on the radar screen, fighters are scrambled to intercept and identify the intruder. Hopefully the target is friendly; if not, it's a bad day for everyone.
This isn't an excerpt from a dystopian graphic novel, or a cut 'n paste from a current aerospace magazine. In truth, this is all ancient history. The system was called SAGE, and was implemented in 1958. We will be talking about the computer behind SAGE, how it made IBM into a powerhouse, and became a pop culture icon.

Bio: Frank O'Brien has been at the Infoage Science Museum for 16 years, contributing to their history/education/public outreach mission. His original focus was as one of the editors of the Apollo Journals, now considered the definitive resource for those interested in mankind's greatest voyage of exploration. Over the last decade he has been a NASA Solar System Ambassador, running events and giving lectures once or twice a month on a wide range of spaceflight topics. Frank graduated from Rutgers University with a degree in Computer Science, and later returned to earn his MBA. Notably, he lives just down the road from where the Martians landed at Grovers Mill in 1938.

T-8: Trading Bitcoin with Neural Networks and Genetic Algorithms, Donn Fishbein (AB8OH), Nquant.com

Abstract: There is still money to be made in trading cryptocurrencies, even if you didn't buy Bitcoin at $1, $100, or $1,000. This talk will explore the application of technical analysis to actively trading Bitcoin derivatives. The use of traditional technical indicators combined with neural networks and genetic algorithms will be discussed. The importance of backtesting, walk-forward testing, and Monte Carlo testing will be demonstrated.

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.

T-9: TCNJ Technology – 3 Poster Presentations:

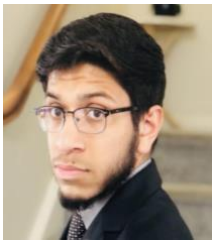
1) Hearing Aid for Dogs, Chris Cassini, Colton Ehrhard, Miguel Flores and Talaal Ahmad

Abstract: The purpose of our project is to develop a hearing aid system for dogs to improve their awareness of their surroundings, which will improve their safety and quality of life. Our inspiration to work on this project hits close to home as the brother of one of our group members has a deaf dog named Jackson, an albino Bull Terrier who was born completely deaf. A typical in-ear hearing aid that amplifies audio will not work for him. Our objective is to design and implement a hearing aid system that is affordable and transforms audio signals into vibrational energy that can be sensed by a dog. We utilized microphones to receive sound, amplify it and turn on vibrators. Small motors used in cell telephones are used for the vibrators. The number of motors activated depends on the sound intensity. The frequency at which the vibrators are pulsed on and off increases as the sound frequency increases. Binaural hearing, the ability to hear in two ears, is vital in deciphering direction of sound. To mimic this, we are incorporating vibration motors on both sides of the dog's body. This entire system is secured onto an adjustable harness to be able to fit Jackson and other sized dogs.

Bio: Colton Ehrhard is a senior electrical engineering student at the College of New Jersey. For their Hearing Aid for Dogs project, he has taken upon the roles as project manager as well as lead printed circuit board designer. He is currently seeking a career in hardware engineering or solar engineering.

Bio: Miguel Flores is a senior electrical engineering student at the College of New Jersey. For their Hearing Aid for Dogs project, he has taken upon the roles as lead code developer and has helped to create the circuitry. He is currently seeking a career in the electrical engineering field.

Bio: Chris Cassini is currently a senior computer engineering student at the College of New Jersey. For the Hearing Aid for Dogs project, he has taken upon the roles of financial manager, selecting hardware components and assisting other team members with programming and implementing our hardware. After college he hopes to work as a software engineer or has a career in business technology.



Bio: Talaal Ahmad is a Senior Electrical Engineering student at the College of New Jersey. For Hearing Aid for Dogs project, he has taken upon the role of web designer and app developer for device while also helping teammates with their respective areas of the project. He hopes to pursue a career within power generation/distribution as it relates to Electrical Engineering.

2) Wireless Sensor Network for Humidity Monitoring, Domenic Minando, Francisco Mesa and Jacob Siwek

Abstract: For this project, the group designed and implemented a wireless sensor network for monitoring humidity. Humidity is measured through using an Arduino, IEEE 802.15.4/Zigbee standards, sensors, and batteries. The whole system is constructed with data sensing nodes, transmission nodes and data receiving/processing units.

3) High Altitude Balloon Design and Experiment, Connor Stine, Francis Moran, Johnathon Taylor, Manthan Tailor and Riya Patel

Abstract: High-altitude weather balloons, also known as HABs, are increasingly popular in meteorological and scientific communities in terms of analyzing atmospheric and weather patterns. Data collected by HABs provides valuable input for computer forecast models that detect and predict weather and storms locally at an economical price. The High-Altitude Weather Balloon project aims to collect atmospheric data using a payload consisting of an electronic sensor and communication system, mounted to a helium balloon. Data including temperature, pressure, humidity and position will be collected by this payload. The overall objective of the project is to design, launch and recover a helium-filled weather balloon system, which carries the aforementioned sensors to collect atmospheric data. The balloon and payload aim to achieve a target altitude of 60,000 feet. Moreover, the payload will collect and store temperature versus altitude as well as humidity versus altitude data.

T-10: Getting Started with Java, Michael Redlich, USJUG

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 presentation will provide an introduction to 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. The example Java application will demonstrate how the attributes of OOP are utilized within Java classes.

Bio: See 10:15 am to 11:10 am time at T-10.

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

T-1: Considerations in Recycling Electronic Waste, John LeMasney, LeMasney Creative

Abstract: This talk presents an overview of offerings, solutions, paths, problems, and other issues related to the recycling of electronic devices. Lead, mercury, and other hazardous e-waste must stay out of the landfills if we are to avoid a contamination disaster. Meanwhile, it can be very difficult and confusing to get rid of your waste properly. Even if someone accepts the electronics, how can you be sure it's not just getting redirected to a landfill overseas? Where does it all end up? Are there other things you can do with these old tech items? This presentation will hopefully help.

Bio: John LeMasney founded and runs LeMasney Creative, a tech, art, construction and organizational consultancy, located in Charlottesville, VA. He provides graphic design, photography and other art related services.

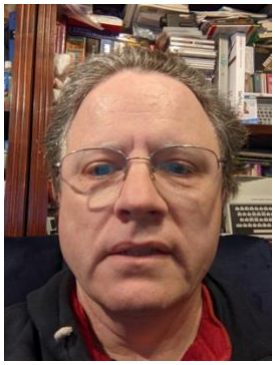
T-2: Mobilizing Your Town Using CAD Maps/Students, Abraham Rodriguez and Heather Butts, Williamsburg High School for Architecture & Design / H.E.A.L.T.H for Youths, Inc.

Abstract: With health, socio-economic and environmental stresses affecting our communities, now more than ever, there's an urgency to engage the next generation of students to contribute towards a more equitable and resilient future. This presentation will showcase how digital collaboration tools are used between community stakeholders and high school students to facilitate meaningful and employable learning experiences through sustainable design.
It will also show why the connections between community service learning, civic engagement, the environment, and academia are a critical and often unexplored arena for learning and interdisciplinary work. This presentation will focus on the intersectionality of diversity issues, underserved communities, environmental equity, classroom education, public health outcomes, governmental laws and policies, and youth education. Tools regarding teaching youth in an urban setting to explore real-life environmental justice issues of a NJ shore town will be explored.

Bio: Abraham Rodriguez is a career and technical educator with a strong passion for design, technology and sustainability. He received his B.A in architectural technology from New York City College of Technology and is a recent graduate from the MS in Sustainability program at The City College of New York, where he focused on topics ranging from industrial ecology and regenerative cities. Before becoming a CTE facilitator at the Williamsburg High School for Architecture and Design, he worked for IBI-Group as an architectural CAD and BIM specialist. Today, he currently teaches the 10th grade, where students learn about collaboration, design thinking and environmental stewardship through work-based learning projects in architecture.

Heather M. Butts received her B.A. from Princeton University. She was a history major, concentrating in American and African-American Studies. She received her J.D. from St. John's University School of Law, her Master's in Public Health from Harvard University and her Master's in Education from Columbia University's Teachers College. She is an Assistant Professor in the Department of Healthcare and Public Administration and Public Health Law and Bioethics at LIU Post. She is also the Director of the LIU Post Honors College. In addition, she has held appointments as an Adjunct Professor in Health Law and Bioethics at St. John's School of Law and Columbia University School of Public Health. She is the co-founder or H.E.A.L.T.H for Youths, Inc. a nonprofit organization which focuses on college readiness and preparation. Her organization partners with 53 programs each year to help more than 4,000 students achieve their dream of going to college. During COVID-19, H.E.A.L.T.H for Youths has worked on dozens of projects to help the community, including: turning Little Free Libraries into food pantries; getting resources to under-privileged families; and organizing several community gardening programs to get fresh produce to those in need.

T-3: DIY Smart Home without requiring the Cloud, Neil Cherry, Computer Deconstruction Lab



Abstract: DIY Smart Home without requiring the Cloud. What if you could build it yourself and limit the need for requiring a cloud service? We all find ourselves wanting to automate a particular device or appliance to do that one task. With the software and hardware technology available today you can build all sorts of interesting devices and services that can leverage the real and virtual devices. I'll introduce to you what's available in hardware and software. Part 1 is the Introduction to the Smart Home, Part 2 is going to build and add Wi-Fi, Zigbee and Z-Wave devices to A Raspberry Pi and Node-RED to do some simple automation.

Bio: Neil Cherry is a Quality Assurance Engineer with Tech Mahindra, has a AAS in Electronics and a BS in Computer Science and Information Systems, Computer Deconstruction Lab board member, and is the author of Wiley's Linux Smart Homes for Dummies. He has been working with computers, computer electronics, and software since 1978; has been playing with X10 since 1982; and began automating his home in 1992 when a friend gave him an X10 computer interface. Neil started the Linux Home Automation web site.

T-4: Internet Job$$$, Donald Hsu, Dominican College.

Abstract: Amazon, Apple, Facebook, Google, IBM, Microsoft, NetFlix, Tesla stocks are up. Yes, the economy is booming. Retirees are working! --- Eighty percent of people got jobs from Internet. Accounting needs 2.1 million (Cyber Security, Forensics, QuickBooks, PeachTree, MS Dynamics); Software Developer/Engineer (Android, C++, Java, C#, Python) - thousands of jobs, but no applicants; Cloud Computing (Amazon AWS, Cisco Webex, Dropbox, IBM, Microsoft Azure, Salesforce, VMWare, Zoom); Big Data (MS Sql server, MongoDB, Oracle, 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, Instagram, LinkedIn, Pinterest, Snapchat, Tiktok. Twitter), Artificial Intelligence, Deep Mining, Quantum Computing, Project/Product Manager, Global Finance, Sales/Marketing of Tech Product/Services --- Computer majors are down 40 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, PhD., Professor Dominican College, Dissertation Chair University of Phoenix, and President Chinese American Scholars Association (CASA). He has trained/taught 70 subjects - Accounting to Unix 14,000+. Clients/students work at Amazon, Apple, 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 Global 500 firms. CASA ran 28 successful E-Leader conferences in Asia and Europe, http://www.g-casa.com. He traveled to 90 countries in Africa, Asia, and Europe for international business. Don's profile is here, with 9,000+ partners/clients on LinkedIn, and 266 public recommendations, https://www.linkedIn.com/in/dohsu.

T-5: Secure Communications with Quantum Key Distribution, Barry Burd, Drew University

Abstract: Transmitting sensitive information can be risky. Public key encryption takes a step in reducing the risk. But, in a way, public key encryption only kicks the can down the road. An eavesdropper can intercept the exchange of a public key, and make the transmission of information invalid. An algorithm named BB84 exploits the weird properties of quantum physics to ensure that any actions on the part of an eavesdropper are detectable. Two parties can share an encryption key with nearly one-hundred percent certainty that the key has not been maliciously copied. The BB84 algorithm is fairly simple, but it's also extremely clever. It's already being used by companies around the world.

Bio: See 11:20 am to 12:15 pm time at T-5.

T-6: Retrofuturism, Eva Kaplan, Consultant in Computer Education based within the parameters of STEM, and research related to Photogenetics and Chromotherapy for our Space and Digital Age

Abstract: A colorful, multi-venue acknowledgement of the future by both the incredible, actual conceptual talent of individuals (current and earlier eras) juxtaposed with creative foresight depicted in imaginative fiction such as The Jetsons, Sonic, Superman, Back to the Future, Futurama…

Bio: Eva has been a presenter for TCF since its inception. Hunter College inducted her into its Hall of Fame for her contributions to Computer Education. In 1964, Eva received a Master's Degree in Interrelated Arts from New York University. Also, to be noted is that in 1961, she established Computers and Kids Summer Camp - often attributed as among the first and longest running computer/technology/STEM summer programs.

T-7: Introduction to the Metaverse, Virtual Reality Tools and Techniques, Orlando and Maria Rivera, Vrspaces.tv & DigitalSummit.TV / New York University, School of Professional Studies; Workshop, ends 2:25 pm

Abstract: The word Metaverse continues to trend and is gaining a lot of momentum in various industries. So, what exactly is the Metaverse, and what will its impact be? We will be exploring the related technology used to create social virtual reality; some of the tools and techniques used to develop social virtual experiences, including avatars, animations, and 3D tools & engines will be presented. We will also explore other organizations implementing these Social Virtual Reality experiences.

Bio: Orlando Rivera (Vrspaces.tv & DigitalSummit.TV) has developed VOD and Live Streaming solutions for QVC, AT&T, InterCall Inc (largest conference and collaborations service provider in the world), BMG, and mobile development for JPMorgan Chase and IBM Watson Center. He is developing VR & AR solutions for the education and Corp market. Orlando has also been a Visual Effects Supervisor for indie feature films, shorts, 3D animations (www.FranknSon.com), and games for the iPad, iPhone & Corp business IOS apps.

Maria Rivera, M.A.Ed. CSM®, has over 12+ years of experience in training and development and digital video. She has developed blended training solutions for various industries including pharmaceutical, real estate, and government agencies. Maria is also a member of the National Speakers Association. She has led strategic initiatives at the Steven L. Newman Real Estate Institute at Baruch College as the Associate Director and also at the CUNY School of Professional Studies/ACS Project as a Deputy Director. She is the former Associate Director, of the Management and Technology and Project Management Graduate Programs at the New York University School of Professional Studies. She is currently the Director of Continuing Education at Berkeley College and is an education consultant for Vrspaces.tv. She designed and will be teaching an Immersive Media course at the NYUSPS Tisch Institute for Global Sport this Spring.

T-8: Hands on Arduino Workshop for Beginners, Katalin Frolio and Evan Williams, Lockheed Martin in Moorestown, NJ / Consultant; Workshop, ends 2:25 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 have 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 have:** A laptop computer with a USB port. **Background Required:** Basic algebra for solving simple equations. **Intended Audience:** Anybody who is interested in electronics is welcomed.

Bio: Katalin Frolio has a BS from TCNJ and an MS from Villanova in Electrical Engineering with a concentration in High Frequency Systems. She currently works as an Electrical Engineer at Lockheed Martin in Moorestown, NJ, and is the chair of the IEEE Young Professionals Princeton/Central Jersey Section. She is also an adjunct professor with the Rowan ECE Department.

Evan Williams began his career in 10th Grade at Princeton University's Microprocessor Lab. This laboratory taught students how to interface 8-bit computers to real-world devices. After graduating 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, and is a ham radio operator.

T-9: TCNJ Technology – 3 Poster Presentations:

1) Active Noise Cancellation Device, Aldemir Sheynov, Daniel Kazlau and Yuri Deyneka

Abstract: Our project is an active noise cancellation device that will significantly reduce the noise pollution caused by devices such as a fan, to allow for a quieter space for work/sleep. For our project, the device filters out noise that is picked up by a microphone and then amplified, inverted, and time delayed to cancel the unwanted sound. The waves cancel each other out, which will result in minimal disturbance. As the signal can be continuous changing, we must adjust in real time. We used circuit lab to build and simulate the filter and the amplifier circuit. Matlab testing of the filter was done and used to generate a bode plot of the frequency response. Currently the system is built and in test.

2) Interesting LED Light With Wireless Remote Control, Andrew Majowicz, Bryce Bishop and Jack Tomkiel

Abstract: Our project is a LED lighting system. The system consists of boards 40 LEDs in 11 serial strings, which will output 5 different color channels of light. These channels are individually controlled by pulse-width modulated (PWM) signals, which change the intensity of the lights. Our custom boards drive the LEDs at constant current for maximum light output. A user can interact by means of our Android application, which sends data to a PSoC embedded microcontroller via Bluetooth. The user can control which LED strings are on and the intensity of their output.

3) Obstacle Mapping Robotic Navigator and Materials Handler, Madison Bland and Shane Chiovarou

Abstract: Robots are commonly utilized in hazardous situations that may put humans in danger, including tasks such as materials handling and navigating unsafe environments. These robots are commonly designed specifically for the location they are deployed or they must be manually controlled by a human to handle different environments. Each of these solutions has the drawbacks of lacking versatility in different locations or is prone to human error. This project is a proof of concept, which has developed a system that alleviates the issues in current systems. The TurtleBot3 WafflePi is used to map an unknown area, navigate to a desired location, and identify and retrieve an object. The goal was to develop a system that augments the TurtleBot with a robotic arm and additional circuitry to allow a user to dictate these actions from a station computer at a safe distance away. A Light Detection and Ranging (LiDAR) sensor is used to generate the map and assist in navigation. From there, machine learning is used to identify the goal object and call Python scripts, which interface with the robotic arm and associated supersonic sensor, in order to pick up the object and return it to a desired location.

Bio: Madison Bland is studying electrical engineering at TCNJ. She is responsible for the mechanical arm design allowing the robot to retrieve objects, as well as the implementation of a machine learning module to identify and retrieve a user desired object. After graduation she plans to attend graduate school to earn her Ph.D. She hopes to continue her career in academia by becoming a professor and participating in research.

Shane Chiovarou is a senior computer engineering major, who is also pursuing a minor in mathematics, at TCNJ. His primary responsibilities in the project include the Navigation and Mapping module as well as the code development for the stepper motors and ultrasonic sensor. After graduation, he plans to join the workforce as a hardware-oriented software engineer.

T-10: Introduction to Python, Chuck Knight, ExxonMobil's Corporate Research Center

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 general 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 40 years; the last 22 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 a Principal Scientific Computing Engineer for ExxonMobil's Scientific Computing team at ExxonMobil's Corporate Research Center. Chuck obtained his BS in Computer Science from Michigan State University, and has an MS in Computer Science, as well as his MBA from the University of Houston.

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

T-1: Princeton's Net-Zero America Study, Eric Larson, Princeton University

Abstract: The Princeton-led Net-Zero America study provides unprecedented sectoral, spatial, and temporal detail describing five varied pathways for the United States to reach net-zero greenhouse gas emissions by 2050. The study quantifies at state and sub-state levels challenges and opportunities with each pathway, including those relating to land use, employment, air pollution-related health, capital mobilization, incumbent fossil fuel businesses, and new clean-energy industries. The study has helped inform diverse stakeholders in federal and state governments, non-profits, philanthropies, and private companies across energy, banking and other sectors.

Bio: Eric Larson is a Senior Research Engineer at Princeton University, where he leads the Energy Systems Analysis Group in the Andlinger Center for Energy and the Environment, and he holds courtesy appointments with the School of Public and International Affairs and the High Meadows Environmental Institute. His research interests intersect engineering, environmental science, economics, and public policy. He co-led Princeton's Net-Zero America study. Trained in mechanical engineering, Larson holds BSE and PhD degrees from Washington University (St. Louis) and the University of Minnesota (Minneapolis), respectively.

T-2: Mobilizing Your Town - Climate Analysis/Students, Geoffrey Fouad, Monmouth University

Abstract: To even the most computationally savvy audience (e.g., software engineers), the computation of geographic data using a constellation of technologies, such as global positioning systems, geographic information systems, and remote sensing, can be a foreign subject. The practice of geographic computations is best exercised in small, manageable case studies. This is why since 2016 Monmouth University's Geographic Information Systems (GIS) Program has partnered with the Borough of Lake Como, a town of less than a square kilometer, for student training opportunities in case studies of community planning and environmental problems. The highly progressive and forward-thinking Environmental Commission of Lake Como has proposed a variety of projects requiring the use of GIS: from basic infrastructure mapping to more complex problems of modeling overland drainage paths using aerial drone technology. Various works over the six years of collaboration between Lake Como and Monmouth University will be presented, highlighting the opportunity for student engagement and the role that an innovative civic partnership can have in teaching geographic problem-solving.

Bio: Geoffrey Fouad is the Geographic Information Systems (GIS) Program Director and University Cartographer of Monmouth University in West Long Branch, New Jersey. His teaching is in the interdisciplinary application of GIS in disciplines as wide-ranging as the humanities and the physical sciences. His research is a reflection of this teaching, with a particular focus on the study of water resources, which is what initially drew Fouad to studies of Lake Como, a shore town with a lake. Fouad has published in journals primarily focused on the Earth sciences, such as the *Journal of Hydrology*, and holds a PhD in geography from the joint doctoral program at San Diego State University and the University of California, Santa Barbara.

T-3: Blockchains vs. the "Right to be Forgotten," Jeff Stollman, RMTMinc.com

Abstract: This talk will answer: Can a blockchain be made to support the EU's General Data Protection Regulation (GDPR) and the "Right of Erasure"? How can it then remain an immutable source of truth? What it takes to implement such a solution? And, where else can this be applied?

Bio: I am a technologist with over three decades of experience working with a variety of technologies. I help clients make sense of the technology puzzle. I provide perspectives on both the threats and the opportunities of technology from a variety of disciplines. I delve deep into new technologies to uncover the "gotchas" that don't get reported by the popular media. I am a polymath with a passion for technology and a skeptical nature that drives me to find ways to break it. I help smart people solve the 1 or 2 technology problems that elude them.

T-4: Social Media Opportunities: From Intern to VP of Strategy, Donald Hsu, Dominican College

Abstract: Social media sites are hot: Chive, Facebook, Foursquare, Google+, Instagram, LinkedIn, Pinterest, Reddit, Tik tok, Tumblr, Twitter, WhatsApp, YouTube and hundreds of new ones being created every week, if not every day! You got 400 friends on Facebook, 500 followers on Twitter, 300 on LinkedIn; can you monetize this friendship? Yes, you can. ---- Companies are hiring 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 got 300+ openings, Monster.com gave 1000+ jobs, Simplyhired.com with 13,480 and Indeed.com with 14,732 jobs in social media. --- The speaker will give you specific details on how you can join a corporation as a social media experts.

Bio: See 12:25 pm to 1:20 pm time at T-4.

T-5: Writing Computer Books, Barry Burd, Drew University

Abstract: How do you write a computer book? How do you propose an idea? What should you send to a publisher? What are publishers looking for? How do you evaluate a writing contract? What are the stages of the authoring process? How much time does the process take? What should you do once the book is published? As an experienced computer book author, I'll answer these questions and many others during this question-and-answer session.

Bio: See 11:20 am to 12:15 pm time at T-5.

T-6: Widening the Lens – The Importance of Circularity in Education, Amy Ryan, ESG Strategies

Abstract: Never before has there been stronger evidence to reconsider the classic pedagogy of education. The concepts of Circular Economy (CE) and Sustainable Development Education (SDE) have existed for decades, but it was the release of the Intergovernmental Panel on Climate Change (IPCC) Report in August 2021 that deeply alarmed and catalyzed the global community, exhausted by COVID-19, to react. The subsequent meteoric rise of Environmental, Social, and Governance (ESG) investments has created a significant amount of confusion that underscores the fragility of linear thinking and process development. It is imperative that our future generations can envision and understand the interrelated aspects and impacts that influence the precarious balance between nature and its inhabitants. Education has a large role in breaking boundaries and to facilitate a shift in the paradigm to one of increased innovation and collaboration. In our ever-changing global environment, circular concepts and design will be paramount in the mitigation of the direst impacts of climate change on society.

Bio: Amy Ryan, Circular Economist and CEO of ESG Strategies (a boutique consultancy) supports clients by identifying elements of Circular Economy (CE) and discovery of environmental impacts (E), social programs (S) and regulatory compliance (G) that exist within their Businesses; and developing gap mitigation strategies, as necessary. With over two decades of experience in compliance systems and analysis, Amy helps corporations, governments and business owners gain a better understanding of CE and ESG and how it can improve their businesses and quality of life.
Earning a BS from the University at Albany (SUNY) and Masters from Harvard University, Amy began her career performing environmental site investigations (Phase I/II, M&A), and compliance verification monitoring (groundwater, air, soil). This lead her to the public sector (VADEQ), where she was responsible for regulatory oversight at over a dozen operations that included military (NAVY, Marines) and industrial manufacturing. Over the next 15 years, Amy held management positions (ERM, WSP) leading multi-media EHS and facilities operations audits, and gaining a deep knowledge of the impact of operational behaviors on enterprise frameworks; holding several roles within risk management, facilities management, and operational excellence at Aramark Corporation (NASDAQ ARMK).
Amy's unique expertise helped her become a trusted advisor on the programmatic and compliance variabilities throughout international business, government, and corporate enterprise across all major industrial sectors. The ability to connect the dots between ESG, Circular Economics and Risk Management has led to her placement on the Boards of Directors for both profit and not for profit organizations including Oil Dri Corporation (NASDAQ ODC) and the European Union's Circular Economy Alliance.

T-7: Introduction to the Metaverse, Virtual Reality Tools and Techniques continued from last session

T-8: Hands on Arduino Workshop for Beginners continued from last session

T-9: TCNJ Technology – 3 Poster Presentations:

1) Video FX FPGA, Dylan Peck, Jeffrey Blanda and Shwetha Raju

Abstract: Computer Graphics Processing Units (GPUs) have evolved tremendously to provide ever-increasing performance and new capabilities; however, small embedded hardware graphics have not received a commensurate level of attention. Field Programmable Gate Arrays (FPGAs) have also substantially increased in performance over the last decade, providing more resources at higher clock rates and lower costs, that can be used to increase the quality of many digital hardware applications. The Video Graphics Array (VGA) standard is an analog standard that is still in use today, utilizing specific timings for enabling a variety of pixel formats. Our group has designed an embedded graphics processor with a VGA frame buffer and a set of instructions that can direct the FPGA to render objects in real-time (60 fps) including line drawing, triangle drawing, and direct pixel mapping. This is accomplished through a host computer, a Raspberry Pi, sending instructions over a proprietary interface.

2) Autonomous Photography Drone Project, Alexander Bolen, Evan Hope, William Apostilico and Fabian Mestanza

Abstract: In today's society, drones have become a prominent marketing tool for real estate advertisements. However, an issue that arises is that realtors must manually operate their drones to take the aesthetic shots they desire. The Autonomous Photography Drone (APD) senior project aims to create an easy-to-use interface that realtors can use at their leisure. It will have the ability to operate both autonomously and manually. This will be accomplished by the creation of a control system diagram, along with a gimbal testing rig for stabilization tuning. The APD will also have the capability to navigate through a projected path via GPS in order to capture high-quality footage of various properties.

Bio: William Apostolico is a Mechanical Engineering student interested in machine component design and is currently working in a machine shop. He focused on quadcopter dynamics, gimbal rig design, and mechanical analysis for the drone. Alex Bolen is an Electrical Engineering student interested in power systems and currently working in the RF field. He mainly focused on the control

system in Simulink and the electrical hardware of the drone. Evan Hope is a Computer Engineering student interested in Software Engineering, cloud computing, machine learning, and computer vision. He worked on the software implementation of the control system as well as the development of the control system in Simulink. Fabian Mestanza is an Electrical Engineering student with post-graduation plans to work with NAVAIR on its Advanced Arresting Gear (AAG) system. He focused on the electrical hardware of the drone and construction of the gimbal testing rig, as well as documenting the administrative work done by the group.

3) Autonomous Racecar Project, Richard Laforteza, Aaron Cassius, Anthony Savvides and Eissa Baluchi

Abstract: The autonomous racecar being produced re-engineers a standard RC car by implementing a NVIDIA Jetson Xavier NX development kit and designing a power distribution system for all of the components. The power distribution includes 2 separate power supplies, one for the powertrain and the other for the computing board. The NVIDIA Jetson has a Convolutional Neural Network software to predict and control the car's movements, when in the car is in its autonomous control mode. The autonomous car control is programmed using Python and the Neural Network implementation is done by applying the TensorFlow library. The car also has a manual control mode in which a user can control the car using an Android Application built using Android Studio.

T-10: Pythonic Object-Oriented Development, Chuck Knight, ExxonMobil's Corporate Research Center

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 12:25 pm to 1:20 pm time at T-10.

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

T-1: Solving the Climate Challenge - An Invitation from Citizens' Climate Lobby, Caroline (Callie) Hancock and Eric Schreiber, Citizens' Climate Lobby (CCL)

Abstract: Citizens' Climate Lobby (CCL) is a nonpartisan grassroots group focused on a national, legislative solution that will reduce America's carbon emissions from fossil fuels, fast. After a quick review of the climate challenge, the presentation will describe how CCL empowers members in 449 local chapters across the U.S. to develop relationships with members of Congress, businesses, and media to help build the political will for a stable climate.

Bio: Caroline (Callie) Hancock was trained as an architect, became accredited in Leadership in Energy and Environmental Design (LEED AP), and worked with architectural firms for many years. In 2013, she realized that climate change is an existential threat, founded the supportive and focused nonpartisan Citizens' Climate Lobby, and started a chapter based in Princeton. Her favorite quotation is from the organization's founder, Marshall Saunders: "I used to think that the important people were taking care of the important things. I don't think that anymore." CCL seeks to empower all people to help build the political will for a stable climate. Callie also serves as the New Jersey State Coordinator for the organization.

Eric Schreiber holds degrees in electrical engineering and applied mathematics. He has worked in consumer electronics, medical devices and, currently, as a software engineer in wireless network research. In the 1990s, attending a lecture as a college student, he listened to Carl Sagan warn about the threat of greenhouse gasses building in earth's atmosphere. "If we are to prevent this climatic danger from working its worst, we will simply have to work together. The principal obstacle is, of course, inertia, resistance to change." Eric joined CCL in 2019, attracted by its considered, nonpartisan, community driven approach to solving climate change and overcoming this resistance.

T-2: Future Methods for Heating and Cooling of Buildings, Gaylord Olson, Consultant

Abstract: To avoid future fossil fuel use in buildings there will likely be a need for heat pumps. In the U.S. today the only heat pumps available are those using outdoor air (air source) or those using underground pipes (ground source). On the other hand, people in Europe have another choice: multi-source heat pumps. This talk will show the fundamental advantage of this new heat pump approach and even better, combine this with long duration (seasonal) underground storage of heat and cold.

Bio: Gaylord Olson is an engineering consultant and inventor currently working on non-fossil fuel heating and cooling of buildings. Some of this work may be found at www.sstusa.net. More recent work is in the form of three recent U.S. patents and also several conference presentations for the American Solar Energy Society and the International District Energy Association. He has an M.S. degree in engineering from UCLA.

T-3: Ultra-Low Energy Structural Health Monitoring (SHM) Sensor Platform, Joe Jesson (W2JEJ), RFSigint Group and E/CE Département, TCNJ

Abstract: Knowing when bridges need repair or replacement is critical as the US yearly repair costs exceed $150M per year. Ignorance of a bridge's current state may trigger a major life-safety problem if not repaired, and a bridge catastrophic failure may occur. Measuring and monitoring the state of the bridge offers a predictor of failure. A sensor platform typically consists of architecture elements including the analog MEMs sensor(s), A/D and logic microcomputer, wireless data transceiver, and power supply. We will also discuss the latest building monitoring methodology of measuring the mechanical resonance changes using MEMS-based accelerometers. This offers the dual use of detecting external wind and storms, and identifying them through pattern classification. Each element is discussed and compared to inflection points over time with the goal of minimizing the energy utilized at each stage. LPWAN (NB-IoT and LoRa) technology, low-power MEMS sensors, and energy-harvesting power supplies will be introduced in the future SHM sensor platform architecture. We will present the RF LoRa and NB-IoT energy measured in our TCNJ Civil Engineering Laboratory and compared to a traditional SHM architecture, both wired and wireless.

Bio: Joe Jesson, is CEO of RFSigint. a Wireless Sensor Patent Advisory Company, and Chief Technology Officer (CTO) 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. He was awarded over 15 patents, and worked on the original TEMPEST signals intelligence program in the 70's. TCNJ Adjunct Electrical Engineering Lecturer since 2013, IEEE Princeton Life Chair, holds graduate degrees from DePaul University in Chicago, and currently a doctoral candidate at NJCU.

T-4: Engineering with Paper: Amazing Structures with Simple Supplies, Godwyn Morris, Dazzling Discoveries

Abstract: When considering earth friendly engineering supplies for students, one of the best building materials can be found in your recycling bin. Paper is both an easily accessible material and an incredibly versatile one. While it is commonly used for drawing and writing, most people do not know how to use it for 3-dimensional projects This session will guide you through a variety of activities that involve designing, building and testing structures using just paper, tape and scissors, You will come away with lessons that teach how to roll, fold, and connect paper in a variety of ways so that you (and your students) can create bridges, skyscrapers, Ferris wheels and other structures using the simplest supplies. This workshop will get you cutting, folding, connecting, and building in a matter of minutes. Be ready to create new projects immediately.

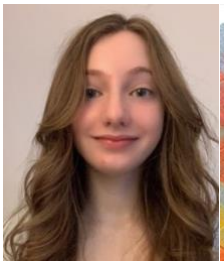
Bio: Godwyn Morris is the director of two programs in New York City: Dazzling Discoveries, a STEAM education center for grade school age children; and Skill Milll NYC, a maker space and digital fabrication studio for adults and teens. She is also the inventor of Dazzlinks Cardboard Engineering kits and co-creator of Engineering with Paper, which are downloadable as packets. Godwyn has been working and creating with educators and children for more than 20 years. She is an advocate of making, mixing, trying, testing and playing, all with the aim of teaching creative thinking and problem-solving skills to kids and adults. She works with hundreds of students and teachers every year in classes, camps and professional development workshops. Her expertise is helping educators bridge the gap between teaching content and expanding hands-on exploration.

T-5: Electronic Devices You Never Knew You Really Needed for Your Car! Paul Bergsman, Author

Abstract: There is an inexpensive alternative to LoJack. A free app to warn you of all approaching U.S. Red Light, and Speed Cameras. And, there is a free alternative to the Sirius Satellite Music Service. These and other devices/apps will be discussed during this presentation.

Bio: Paul Bergsman has been involved with computers since he saw a sales pitch for people to buy a Texas Instruments Ti994A Home Computer for $100! Since then, he has obtained a Masters in Computer Science, and wrote a book, “Controlling the World with Your PC (c) 1993”, about interfacing, and controlling electronic devices via your computer's Parallel Printer Port. The book remained in print for over ten years. A rather long run for a rapidly evolving technology. Paul also holds a U.S. Patent for an electro-mechanical keyed lock for use in commercial alarm systems, and taught Mathematics, Computer Science and Industrial Arts in high school for 30 years.

T-6: Rebooting K-12 STEM Education Amid This Pandemic, Heidi Hudicka and Joe Hudicka, Fizzee Labs Foundation™



Abstract: My Mars Mission is a daughter and father mission, where we are dedicated to rebooting K-12 STEM education. Using the MyMarsMission air quality kit, learners will discover how to solder, code, and collect humidity, temperature, and CO2 data levels in their current locations. This can then be applied to the worldwide issue of the pandemic and will alert students as to when they need to open a window.

Bio: Heidi Hudicka, began her innovation adventure when she was just 4 years old, creating a fashion clothing line for her 18” doll collection, desiring them to enjoy a truly unique experience, unlike the clothes everyone else was buying in stores. Heidi quickly became an expert in design, developing a unique ability to inspire creative experiences that her clients would truly love to be a part of. When Heidi realized how much she was learning about the power of her creativity, she teamed with her sibling Joey to create LAUNCH!, an interactive board game designed to teach grade-schoolers the vocabulary and fundamentals of entrepreneurship. It was this special moment that sparked their own launch of Fizzee Labs, and today through a strategic partnership supporting NASA’s education goals, these LAUNCH! Party Fun & Learning events are becoming a National Competition Series!

T-7: Introduction to Switch Mode Power Technology, Manuel C. 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 B.S. and M.S. in Electrical Engineering from New Jersey Institute of Technology. He is a senior member of the IEEE and active in its Power Electronics and Industrial Electronics societies.

T-8: Introduction to Cricut and Home Electronic Cutting Machines, Brenda Bell, ACGNJ

Abstract: In this session, we'll discuss what home cutting machines are, some of their uses, and look at some of the models currently on the market. We'll then focus in on the current series of Cricut cutters, using Design Space software to demonstrate how to design and produce a simple project. *Updated for 2022 with information on the Explore 3 and Maker 3 machines.*

Bio: No stranger to presentations, 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 2018 and spent her first two weeks with the device bumping her head against its software's limitations. (She has since figured out how to use third-party software to create her own designs.) Brenda worked at Michaels from 2011 to 2021 and has led Cricut classes there. In her spare time, she is Secretary of ACGNJ, where she has facilitated the Mobile Devices SIG for the past eleven years. She 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.

T-9: TCNJ Technology – 2 Poster Presentations plus Special Session:

1) Design of a Low-Cost UHF RFID Transceiver, Catherine Newman and Gabriel Levey

Abstract: The system is comprised of a PC, a USB/UART dongle, and two Microcontroller Transceiver boards. One Microcontroller Transceiver functions as a slave to the PC and communicates with it via the USB/UART dongle. That same Microcontroller Transceiver also functions as the Transmitter of the system and as the master to the second Microcontroller Transceiver, which also functions as the Receiver of the system. The Master and Slave Microcontroller Transceivers connect via SPI.

2) 5G MIMO Antenna, Joseph Loggi and Nicholas Lusdyk

Abstract: Telecommunications is an important field in electronics, as most exchange of data is done over the internet and mobile devices. With more interest in faster and more reliable communication methods comes the development of more efficient hardware. The release of 5G communication to the public has prompted such a wave of development to handle the increased number of mobile users. In this project the focus is on developing a steerable beamforming 5G sub 6 GHz antenna array using a butler matrix and minimal hardware. This antenna features both axial and radial rotation in which the beam can specifically send data in a particular direction, while still maintaining the integrity of the signal. The antenna array features four Micropatch antennas connected to a hybrid quadrature coupler, which is fed by the input signal. The output signal depends on the input terminal of the coupler as well as the variation in delayed input for each antenna. The designing and testing of this antenna are important as such research allows for better made hardware, as well as better ideas for implementing large scale telecommunication systems.

T-9a: A Special Session: Memorial for David Soll will be held at approximately 3 pm.

T-10: Special Session: Ask Me Anything, Michael Redlich, Chuck Knight and Barry Burd, Garden State Java User Group (GSJUG)

Abstract: In this special session, Michael Redlich, Chuck Knight and Barry Burd will be available for attendees to ask any question related to programming languages, general programming concepts, the IT industry and anything else that may be of interest. The facilitators will have their laptops running for any real-time demonstrations.

Bio: See Mike Redlich and Chuck Knight See 12:25 pm to 1:20 pm time at T-10. See Barry Burd at 11:20 am to 12:15 pm time in T-5.

***********9:00 am to 5:00 pm***********

HAM RADIO License Exam Preparation Cram Course (Virtual License Testing to begin at 3:30 pm. Advance registration is required for the virtual exam session).

T-11: Get a Ham Radio License in One Day! Alan Wolke, W2AEW, Pat Howard, K2PAT and Joe Zaroff, WA3NEQ; David Sarnoff Radio Club.

Abstract: If you wanted to get an amateur radio license but never had the time, now is your opportunity! To obtain the entry-level Technician license, all one has to do is pass a multiple-choice exam. The course will step through the information needed to pass the FCC Technician License exam. Preparation prior to participation in the course and the exam is strongly encouraged. The slide presentation in the class that follows the truly wonderful and free study guide can be found at http://www.kb6nu.com/tech-manual/. Students are strongly urged to make use of it. Online practice exams are also of great benefit, http://qrz.com/hamtest/. A PDF copy of the slides can be found here: https://drive.google.com/file/d/0B8Kvsw95jCqIeFZrU3E0R1k2TFU/view?usp=sharing. For further study a comprehensive set of slides that have been used in past classes, along with the complete Technician Class Question Pool material can be found at: https://drive.google.com/folderview?id=0B8LbPwo1XLI3YTBDZlFmTTNBQzA&usp=sharing.
The topic agenda for the Technician Class Ham Cram will be:
- What is Amateur Radio
- Electrical Principles
- Math for Electronics
- Basic Electronics and Components
- Schematics
- Radio Wave Properties
- Propagation
- Antennas & Feedlines
- Amateur Radio Signal/Modulation Types
- Safety Concepts
- RF Exposure
- Station Setup & Operation
- Operating Controls
- Station Equipment
- Common Troubleshooting
- Using a Multimeter or DMM
- Operating Procedures
- Public Service
- Amateur Satellites
- Fun Activities & Internet
- Rules, Regulations & Definitions

The class will begin at 9:00 am, lunch at 12:30 pm. Time permitting, we will run through a few practice exams prior to the actual testing 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, have an original and a photocopy of current license. Results of your test will be provided after exam session is completed.

Bio: The VEs are:
John DeGood NU3E (VE team coordinator)
Michael Harla N2MHO
Walter Lesnovich W2EE
Carlos Prior KE2TT
Eric Russell KD2ONY
Cathy Tsao KD2UGE
Hillary Zaenchik KC2HLA
Joe Zaroff WA3NEQ
Joe Speroni AH0A