Volume 60 – Issue 06

Contents

Upcoming Events

We have a number of events coming up this month. Be sure to check out the Section Website

https://r4.ieee.org/sem

As well as vtools:

IEEE Region 4 - SE Michigan Section Upcoming

Listed below are some of the events, FYI.

Event	Date	Time
Linux in your everyday tech life	02 Jun 2020	06:00 PM
TEMSCON 2020 CONFERENCE	03 Jun 2020	08:00 AM
SEM Section ExCom Monthly Meeting (Teleconference) for June 2020	04 Jun 2020	12:00 PM
Ch8: AdCom Teleconference	11 Jun 2020	11:00 AM
Basic TCP/UDP/IP network protocols for future engineers	11 Jun 2020	06:00 PM
MicroController Debug Training Workshop 2020 (Virtual) – Part 1	16 Jun 2020	06:00 PM
Pre-Compliance EMI Debugging	18 Jun 2020	05:30 PM
MicroController Debug Training Workshop 2020 (Virtual) – Part 2	23 Jun 2020	06:00 PM
EduCom Monthly Meeting - Jun	23 Jun 2020	07:00 PM
Impact COVID-19 on the Internet ecosystem	25 Jun 2020	06:00 PM

Chair's Message

2020 continues to bring unique challenges for all of us. I've made the difficult decision to change our July face-to-face executive meeting to a Zoom Conference. The executive meeting is a great opportunity for new volunteers to get involved with section activities. We will be looking for ways to improve collaboration on the Zoom platform to make up for the lack of face to face connection.

There are still plenty of great ways to get involved with IEEE activities during the COVID outbreak. The 2020 TEMSCON that was originally scheduled to be held in our section, has moved to a virtual meeting.

Section members can register for free at:
https://meetings.vtools.ieee.org/m/229907

Since the start of the COVID pandemic, several of Southeastern Michigan's Chapters have held or are planning virtual meetings. There are details about some great upcoming virtual meetings within this issue of Wavelengths. This month I'd like to specifically thank Chapter 5 (Computer Society). In additional to successfully transitioning towards virtual meetings, they recently received an Honorable Mention Award as an Outstanding Chapter. They have continually been one of the most active chapters in our section because of a great volunteer staff.

Lastly, I know this is a time of great uncertainty in many people's personal and professional lives. There are several great resources available through IEEE and locally through our partner organizations. Do not hesitate to reach out to any member of the Executive team with any questions or concerns.

Thank you for reading this month and stay safe.

David Mindham: **dmindham -At- ieee.org**

Outstanding Chapter Award

IEEE COMPUTER SOCIETY

2019 Outstanding Chapter Award
Honorable Mention

presented to the

IEEE Computer Society
Southeastern Michigan Computer Society Chapter

"For the Computer Society Professional Chapter providing a high quality set of programs and activities for its local members"

Melissa A. Russell, Executive Director
Dec 2019

ICCOTWT 2020

Fifth International Conference on Cloud of Things and Wearable Technologies 2020

Scope

ICCOTWT 2020 will be the most comprehensive conference focused on the various aspects of Cloud of Things and Wearable Technologies. This Conference provides a chance for academic and industry professionals to discuss recent progress in the area of Cloud of Things and Wearable Technologies. Furthermore, we expect that the conference and its publications will be a trigger for further related research and technology improvements in this important subject.

The goal of this conference is to bring together the researchers from academia and industry as well as practitioners to share ideas, problems and solutions relating to the multifaceted aspects of Cloud of Things and Wearable Technologies.

To provide opportunities for the different research area delegates to exchange new ideas and application experiences face to face, to establish business / research relations to find global partners for future collaboration in the areas of Cloud of Things and Wearable Technologies. Papers describing new methods or technologies, advanced prototypes, systems, tools and techniques and general survey papers indicating future directions are also encouraged. Papers describing original work are invited in any of the areas listed below. Accepted papers, presented at the conference by one of the authors, will be published in the Proceedings of ICCOTWT 2020, with an ISBN. Acceptance will be based on quality, relevance and originality. Both full research reports and work-in-progress reports are welcome. There will be both oral and virtual sessions.

The papers will be made to appear in a book to be published by ASDF HQ, India in EDLIB (www.edlib.net). All the published paper will be indexed by Google Scholar and various others search engines.

ALL THE PAPERS SUBMITTED ARE DOUBLE PEER REVIEWED
Tracks of the Conference

- 5G Networks and IoT
- Software Defined Network (SDN) and IoT
- Sensor and Actuator Networks
- Ultra-low power IoT Technologies and Embedded Systems Architectures
- Wearables, Body Sensor Networks, Smart Portable Devices
- Design Space Exploration Techniques for IoT Devices and Systems
- Heterogeneous Networks, Web of Things, Web of Everything
- IoT Protocols (IPv6, 6LoWPAN, RPL, 6TiSCH, W3C)
- Named Data Networking for IoT
- Internet of Nano Things
- Sensors Data Management, IoT Mining and Analytics
- Adaptive Systems and Models at Runtime
- Distributed Storage, Data Fusion
- Routing and Control Protocols
- Resource Management, Access Control
- Mobility, Localization and Management Aspects
- Identity Management and Object Recognition
- Localization Technologies
- Edge Computing, Fog Computing and IoT
- Machine to Machine (M2M)/Devices-to-Devices communications and IoT
- Industrial IoT and Factory of Things and Internet of Things
- Cyber-physical systems, Context Awareness, Situation Awareness, Ambient Intelligence
- Collaborative Applications and Systems
- Service Experiences and Analysis
- Smart Cities, Smart Public Places, Smart Home/Building Automation
- e-Health, e-Wellness, Automotive, Intelligent Transport
- Smart Grid, Energy Management
- Consumer Electronics, Assisted Living, Rural Services and ProductionIndustrial IoT Service Creation and Management Aspects
- Crowd-sensing, human centric sensing
- Big data and IoT Data Analytics
- Internet Applications Naming and Identifiers
- Semantic Technologies, Collective Intelligence
- Cognitive and Reasoning about Things and Smart Objects
- Mobile Cloud Computing (MCC) and IoT
- Horizontal application development for IoT
- Design principles, best practices for IoT development
- Human Role in the IoT, Social Aspects and Services
- Value Chain Analysis and Evolution Aspects
- New Human-Device Interactions for IoT, Do-It-Yourself
- Social Models and Networks
- Green IoT: Sustainable Design and Technologies

- Urban Dynamics and crowdsourcing services
- Metrics, Measurements, and Evaluation of IoT Sustainability and ROI
- IoT Privacy and Security Concerns
- Identification and authentication issues
- Wireless sensor network for IoT security
- Intrusion detection in IoT
- Cryptography, key management and authorization for IoT
- Physical/MAC/Network Attacks in Internet of Things
- Multi-Objective IoT System Modeling and Analysis
- IoT Interconnections Analysis
- Real case deployment scenarios and results
- IoT deployment at Government and ISPs
- IoT deployment on agriculture, retails, smart cities, etc.
- IoT Interconnections among ISPs Analysis
- IoT QoS, Scalability, Performance, Interference
- Gaps Analysis for real deployment
- IoT and Future Internet architectures

- Cross-layer attacks in IoT & Security with QoS optimization in IoT
- Privacy based channel access in IoT & IoT forensic science
- Big data and information integrity in IoT
- Communication security in IoT
- Security standards in IoT
- Closing the Gap between Research and Implementation
- Experimental prototypes, Test-Bed and Field Trial Experiences

Proceedings Publications

All the registered papers of ICCOTWT 2020 will be complied in the form of Proceedings with unique ISBN.

- ISBN 13 : To be Assigned
- ISBN 10 : To be Assigned

Journals Publications

Selected papers of the Conference publication may be recommended for publication in Reputed Journals (Print Edition) after acquiring the written consent from the authors of the paper(s) subject to any other fees related to the publication. Publication into the Journals is at the discretion of the Publisher(s) and not into the hands of ASDF or the Host Institute. Further, the waiting period of the Journal Publication will be mentioned in the Acceptance Letter and shall not be forced to modify at any sequence.

Click here to View the Journals

Paper Submission

Authors should submit a paper in English, carefully checked for correct grammar and spelling, addressing one or several of the conference areas or topics. Each paper should clearly indicate the nature of its technical/scientific contribution, and the problems, domains or environments to which it is applicable. Only original papers should be submitted. Authors are advised to follow ethical norms regarding plagiarism and self-plagiarism thoroughly before submitting and must make sure that their submissions do not substantially overlap work which has been published elsewhere or simultaneously submitted to a journal or another conference with proceedings. Papers that contain any form of plagiarism will be rejected without reviews.

Authors can submit their work in the form of a Regular Paper, representing completed and validated research, or as a Position Paper, portraying a short report of work in progress or an arguable opinion about an issue discussing ideas, facts, situations, methods, procedures or results of scientific research focused on one of the conference topic areas. All papers must be submitted through the online submission platform. After the paper submission has been successfully completed, authors will receive an automatic confirmation e-mail.

All the papers should be of 6 pages' length and should adhere to the template prescribed in the ASDF KIT. Please read through the instructions in the below link before preparing the final template.

Download Paper Preparation KIT   Submit Paper Now

Category	EUR/Dollar
Authors	200
Delegate	100
Students	50
Extra Pages (Per Page)	25

- Due to Pandemic conditions and uncertainty, ICCOTWT 2020 Conference is now a Virtual Conference.
- One regular registration can cover a paper within SIX pages, including all figures, tables, and references for one main author of the paper.
- One regular registration covers only one author. Co-authors **SHOULD** also register in-order to display their name in the conference proceedings.
- All the registration fees quoted above are excluding the Taxes (20%).
- Additional fees for the co-authors of the paper as applicable during the registration.

Important Dates

Description	Date
Paper Submission	31 - May - 2020
Acceptance Notification	Continuous Process
Author Registration	14 - June - 2020
CRC & Copyright Submission	14 - June - 2020
Listener Registration	14 - June - 2020
Conference Start Date	09 - July - 2020
Conference End Date	10 - July - 2020

RoboFest – Update:

Recognition of some IEEE Volunteers for Robofest 2020

IEEE SEM sponsored Robofest was getting help from across the nation and around the world from IEEE members before the lockdown.

IEEE WIE and IEEE KAU student branch at King Abdulaziz University (KAU) in Saudi Arabia assisted Robofest competition on March 8, 2020. The names of the 4 IEEE student members are: Batoul Ahmad Alattas, Ghadeer Hashem Alzahrani, FORAT ABDULLAH ALBARNAWI, and Jood Khalil Khoja. A photo of 2 IEEE members are shown on the right.

In Florida, on March 7th, IEEE members from Florida West Coast Section attended *Robofest 2020* at Nielsen Media in Oldsmar, FL. The picture left blow shows Michael Okneski, IEEE member with a RoboParade team. The picture below right shows Sean Denny, IEEE member (left) and Emma Alaba, Robofest Site Host (right).

In Michigan, Benancio Gonzalez, IEEE member has helped with multiple competitions as well as kick off meetings. See picture on the right. Several other IEEE members signed up as Judges for the World Championship on May 16, cancelled due to Coronavirus. We are planning Online World Championship events using Zoom Webinar conferencing tool every weekend in late August ~ early October. For details, please visit www.robofest.net .

Amateur Radio 4

The 2ⁿᵈ FCC Defined Purpose for Hams:

Last month in this column, we looked at the third of the 5 basic reasons why the US Federal Government established the Amateur Radio Service.

This month, I want to focus on the 4ᵗʰ purpose in CFR part 97.1…

> **(d) Expansion of the existing reservoir within the amateur radio service of trained operators, technicians, and electronics experts.**

The 'reservoir' was most apparent at the beginning of WW I and again in WW II when the military suddenly needed large numbers of radio operators for communications, building specialized equipment an antennas, and teaching other solders, sailors and airmen the fundamentals of electronics, radio wave propagation and Morse code.

Not only were the radio amateurs in demand because of their understanding of theory but, for their experience in holding actual communications between stations under great diversity of conditions.

This experience is also prized today by employers looking for workers who won't stop when they encounter a problem, or come to their manager for direction but, actively work to find ways to overcome and continue to get the job done. The experiences gained by assembling your own radio station, with all the integration of power supplies modulators, computers, oscillators, amplifiers, switching systems, antennas, grounding and lightening protection and software provide a fertile environment for personal and technical growth that is difficult to acquire in formal education.

When I managed an EMC test laboratory, we used to say that a candidate who was also an Amateur Radio Operator was someone we could count on to know which end of a soldering iron to grab first.

Not that 'Hams' are more intelligent than anyone else but, because they are more likely to have already experienced what happens when you do grab the wrong end of the soldering iron and are likely not to repeat that particular error.

****

Shown below, is a part, excerpted from the United States Code of Federal Regulations (CFR),
CFR Title 47: Telecommunication

"The rules and regulations in this part are designed to provide an amateur radio service having a fundamental purpose as expressed in the following principles:"
****

PART 97—AMATEUR RADIO SERVICE
§97.1 Basis and purpose.

(a) Recognition and enhancement of the value of the amateur service to the public as a voluntary noncommercial communication service, particularly with respect to providing emergency communications.

(b) Continuation and extension of the amateur's proven ability to contribute to the advancement of the radio art.

(c) Encouragement and improvement of the amateur service through rules which provide for advancing skills in both the communication and technical phases of the art.

(d) Expansion of the existing reservoir within the amateur radio service of trained operators, technicians, and electronics experts.

(e) Continuation and extension of the amateur's unique ability to enhance international goodwill."
(*The underlines above are my addition to the text.*)

Chapter 5 Linux Webinar

IEEE SE Michigan Section
Presents
"Linux in your Everyday Life"

IEEE Southeastern Michigan Section Computer Society and Education Society are happy to announce its weekly technical meeting/webinar: this time featuring the topic: "Linux in your everyday life". The topic is currently of keen interest to IEEE members and will cover several areas where Linux, a wildly popular Open Source Operating System (and software ecosystem I may add), touches our lives without any of us knowing or realizing this.

There is no cost to attending the event. However, we encourage all those attending to consider becoming an IEEE Member, various levels are available such as Student, Associate, Professional, etc. For a complete description of the Member process and its benefits:

https://www.ieee.org/membership/benefits/index.html

We also invite those who attend or plan to attend to use the link to provide suggestions for future topics of their interest.

Pre-Registration Required!

https://events.vtools.ieee.org/m/230183

At Glance

- **When:**
  Date: June 02, 2020
  Time: 6:00 PM – 7:25 PM

- **Where:**
  Online via Jit.si (to be shared only after you have registered)

- **Audience:** All Eligible Members, Senior members and Potential Members

*

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Computer Society
&
Education Society

Lunar Power Habitat

PowerHab student team from University of Strathclyde design power system for a lunar habitat

Who are we?

We are PowerHab, a team of fourth- and fifth-year engineering students from the University of Strathclyde. Supervised by Prof. Massimiliano Vasile, we were selected to participate in the IGLUNA 2020 campaign.

PowerHab's objective is to develop a system capable of providing a lunar habitat with its required power needs, whilst maintaining resiliency in the harsh lunar environment.

To achieve this objective, we have devised a range of concepts which satisfy the issues of power harvest, storage and distribution. We envision constellations of Solar Power Satellites (SPS), with Solar Reflecting Satellites, complementing ground-based solar arrays. The SPS utilise microwave wireless power transmission to transfer the harvest energy to the lunar surface. The Reflector Satellites complement this by reflecting and focusing solar radiation towards the SPS, thereby increasing the irradiance incident upon them and reducing their required array size. To store this energy, we have explored designs for Advanced Li-Ion Battery Systems, Thermal Mass Storage Systems and a novel Regenerative Hydrogen Fuel Cell, allowing both power storage and generation.

What is IGLUNA 2020?

IGLUNA 2020 is an international project launched by the Swiss Space Center (SSC) in collaboration with the European Space Agency (ESA) to allow student teams from around Europe to apply their knowledge in the development of sub-systems for a mock Lunar Habitat.

The purpose of this mission is to demonstrate technologies capable of supporting a manned lunar base, incorporating remote operation.

For the 2019 edition, over 150 students organised in 19 teams across 13 European universities worked on developing a human habitat in ice. Each team focused on a specific aspect of the habitat, combining to produce a long-term solution for human-Lunar habitation.

IGLUNA 2020 started in September 2019 with 16 teams of students from 11 European universities who are developing their technologies over two academic semesters until the final Field Campaign demonstration at the Verkehrshaus – Swiss Museum of Transport and on the Pilatus from the 10 to the 19 July 2020.

The Challenge

As the IGLUNA team responsible for the lunar habitat power system, we have been tasked to design a system that provides 150k watt hours (wh) of energy to the habitat. This value was determined as we wish our system to provide a similar magnitude of power to the International Space Station, with an additional margin for redundancy. This is the key design attribute for each subsystem and will influence all design decisions made throughout the course of the project.

Our Team Members

Our team consists of eight fourth- and fifth-year engineering students from multiple disciplines each tasked with designing a separate component or sub-system of the overall power system as follows:

Drew
Team Leader & Systems Engineer
Mechanical & Aerospace Engineering

Donald
Orbital Mechanics
Mechanical & Aerospace Engineering

Finlay
Battery Systems
Electronic & Electrical Engineering

Sam
Wireless Power Transmission
Mechanical Engineering

Gareth
Co-Team & Satellites Lead
Mechanical & Aerospace Engineering

Bradley
Solar Power Satellites
Mechanical & Aerospace Engineering

Gavin
Fuel Cell Lead
Mechanical & Aerospace Engineering

Alex
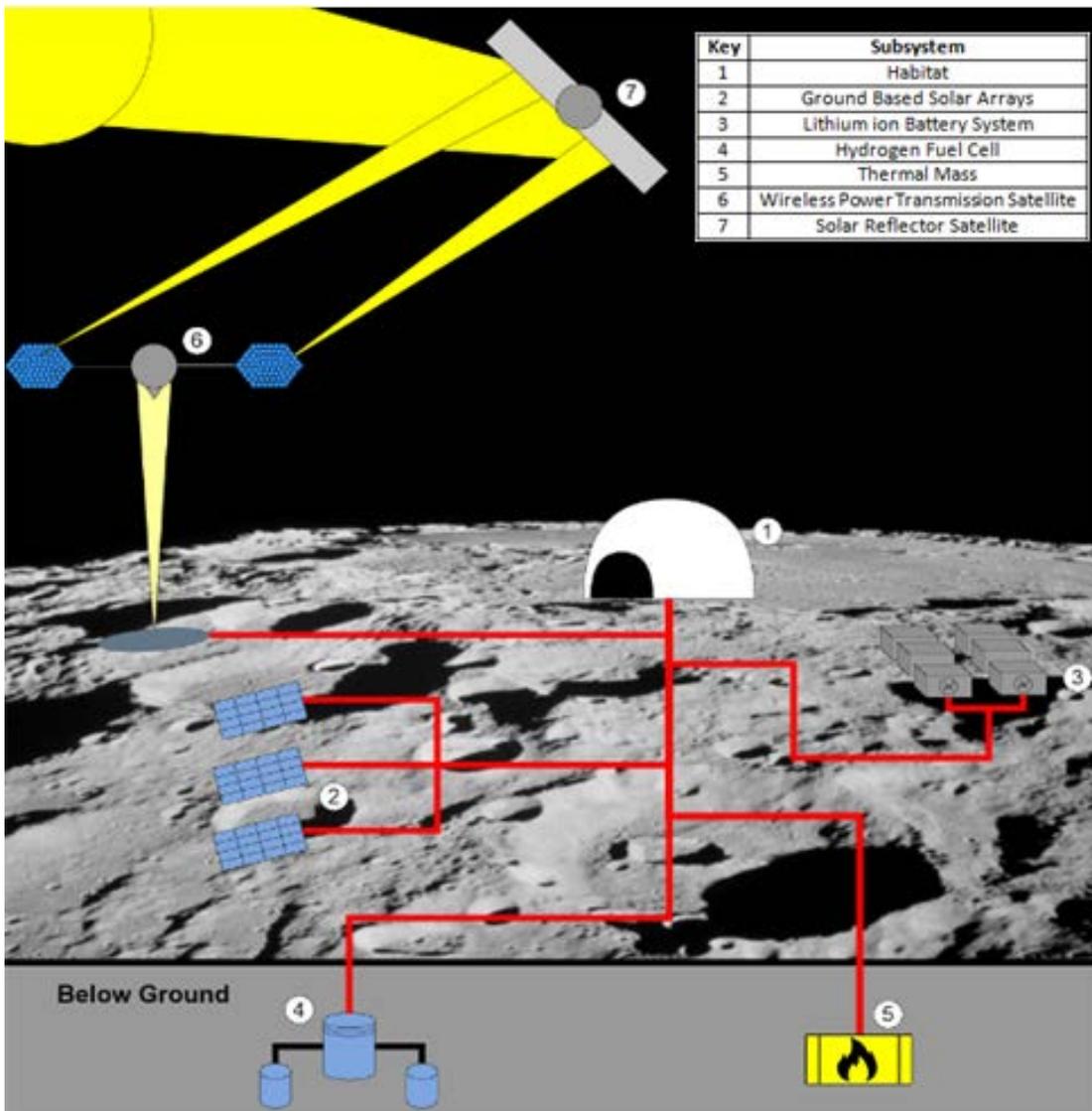Thermal Mass
Mechanical Engineering

Team Structure

The PowerHab team works in collaboration with both the Swiss Space Center and European Space Agency who provide coaching and ensure designs are feasible to present at the IGLUNA field campaign. The team also receives academic supervision and assistance from Professor Massimiliano Vasile and his PhD students Andrew Wilson and Gianluca Filippi.
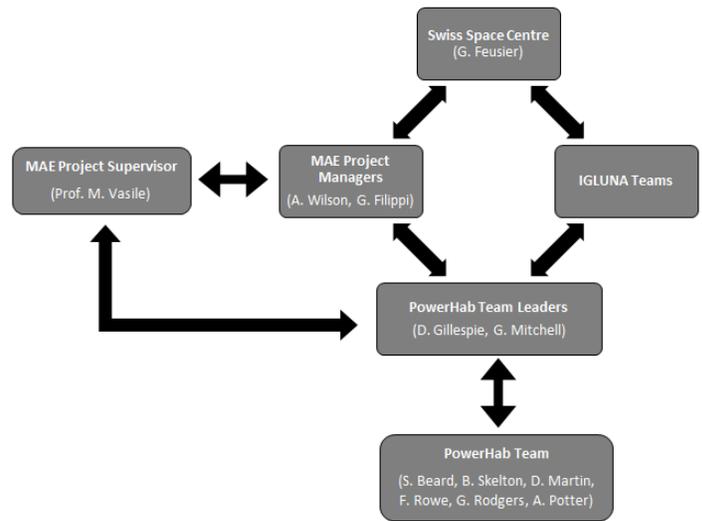
Our Concept

Our power system is designed to provide viable energy generation, storage and distribution to a lunar habitat and incorporate multiple subsystems to allow for redundancy should one subsystem fail. The various subsystems are diverse and explore different technologies to provide a wide range of options for future IGLUNA projects.
The overall system design is shown below.

Key	Subsystem
1	Habitat
2	Ground Based Solar Arrays
3	Lithium ion Battery System
4	Hydrogen Fuel Cell
5	Thermal Mass
6	Wireless Power Transmission Satellite
7	Solar Reflector Satellite

As shown, the designed power system represents a micro grid with numerous energy storage and generation options spread across the lunar surface. The satellites will be constellations to allow for constant coverage and supply to the habitat even during the lunar night.

Each subsystem is briefly explained as follows:

Solar Reflector Satellites

Solar reflector satellites are used to reflect solar radiation onto the PV panels present on the WPT satellites. These reflector satellites will operate using mirrors and track both the position of the sun and the position of the WPT satellite it is beaming too. A constellation of satellites is implemented to allow for constant reflecting of solar radiation to the WPT satellite even during lunar night.

Wireless Power Transmission Satellites
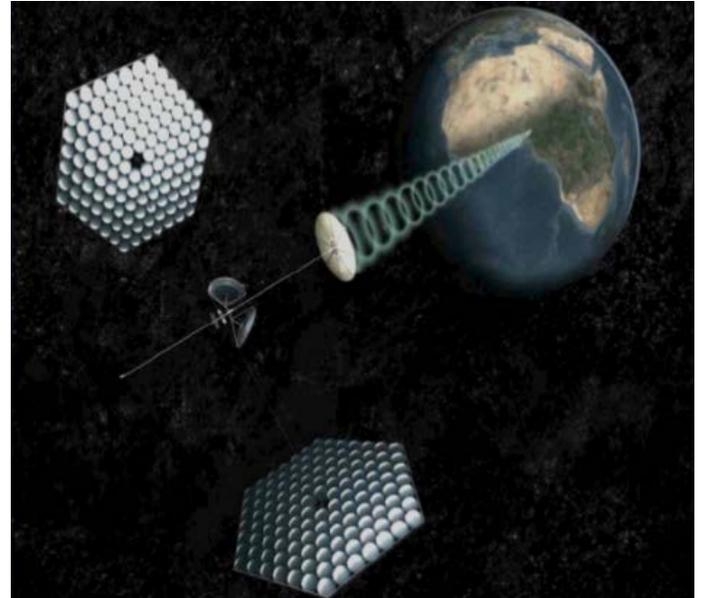
Wireless power transmission satellites are powered via PV arrays which receive solar radiation from both the sun and from the solar reflector satellites. A microwave emitter is then used to beam down energy to the habitat. Rectennas will be present on the lunar surface to harness the microwaves and convert them into DC electricity which can then be distributed either to the habitat or to the energy storage systems.

Ground Based Solar Arrays

The ground based solar arrays are made up of numerous Photo-Voltaic (PV) panels and generate energy from harnessed solar radiation during the lunar day. The cells track the sun across the sky and are angled accordingly to operate at maximum efficiency. The PV panels are connected to a central DC bus and provide DC electricity to the habitat.

Lithium-ion Energy Storage System

The lithium-ion energy storage system consists of multiple battery banks spread out across the lunar surface. Each bank contains multiple modules made up of hundreds of NCR li-ion cells arranged in series and parallel to meet the voltage and current requirements of the habitat. The banks provide DC electricity, are connected to the habitat via high voltage DC (HVDC) power cables and can be recharged via the ground based solar array and WPT satellites.

Hydrogen Fuel Cell Energy Storage System

The regenerative hydrogen fuel cell uses a proton exchange membrane (PEM) and an electrolyser to produce hydrogen and oxygen from water which can be sourced from craters on the lunar surface. The fuel cell then creates electricity through the transfer of hydrogen electrons which pass through the cell and recombine with protons and oxygen atoms across the membrane. The fuel cell will provide DC power and be buried in lunar regolith to protect the system from environmental hazards.

Thermal Mass Energy Storage System

The thermal mass energy storage system heats up thermal fluid on the moon's surface by utilising solar reflectors to concentrate solar radiation onto a pipe containing the fluid. From there the fluid is passed into a high temperature reservoir and used to power Stirling engines thus providing AC electricity to the habitat.

Next Steps

The next steps for the team are to design our subsystems and verify them with our academic supervisors and the Swiss Space Center. We are also planning to develop prototypes throughout the next few months as we wish to demonstrate our subsystem principles at the IGLUNA field campaign. We will therefore be carrying out lab work, printed circuit board development, physical and safety testing and software development in order to provide an in depth exhibition at the campaign in July. We will be providing several more articles in the coming months to update interested parties on our progress.

Downloads

- Individuals: PowerHab Crowdfunding brochure
  PDF, 1.2 MB
- Companies: PowerHab Crowdfunding brochure
  PDF, 1.4 MB

PowerHab **FOLLOW**

We are PowerHab! A team of fourth- and fifth-year engineering students from the University of Strathclyde selected to participate in the IGLUNA 2020 campaign with the Swiss Space Center and ESA. Our objective is to develop a system capable of powering a lunar habitat whilst maintaining resiliency in the harsh lunar environment.
24 Mar 2020, 13:30

COVID Impact Webinar

IEEE SE Michigan Section
Presents
"Impact of COVID-19 on the Internet ecosystem"

IEEE Southeastern Michigan Section Computer Society and Education Society are happy to announce its weekly technical meeting/webinar featuring the topic: "Impact of COVID-19 on the internet ecosystem". The topic is currently of keen interest to IEEE members. There is no cost to attending the event. However, we encourage all those attending to consider becoming an IEEE Member. For a complete description of the Member process and its benefits:

https://www.ieee.org/membership/benefits/index.html

We also invite those who attend or plan to attend to use the link to provide suggestions for future topics of their interest.

Pre-Registration Required!
https://events.vtools.ieee.org/m/230295

At Glance

- **When:**
  Date: June 25, 2020
  Time: 6:00 PM – 7:25 PM

- **Where:**
  Online via Jit.si (to be shared only after you have registered)

- **Audience:** All Eligible Members, Senior members and Potential Members

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ZF Employment Ad

Flexing

Every Tuesday at 7:30 a.m. Pacific Time, I join a video conference call with leadership colleagues from across the country. I'm on the West Coast, so these meetings are always early for me. When I started joining them more than 10 years ago, I was up early to ensure that I looked polished and ready to conquer the day before I got on the video conference. These days, I find myself forgoing dressing up or putting on makeup before dialing in. I no longer think twice about being on video from the comfort of my living room and in my morning sweatshirt. And, as I say good morning to my colleagues, it's apparent that I'm not the only one.

It hasn't always been this way. Our company has come a long way over the past decade by truly instilling a culture of flexibility across the firm. We now have the ability to work in a way that fits our personal lives and, if that means taking an early morning video call at home in our sweatpants, then so be it.

When others ask me how we did it, I'm honest. This did not happen overnight. It wasn't easy, there were growing pains along the way, and we're still learning. Here's some of what we learned along the way that we hope other companies can benefit from:

You need to toss out the rule book. To build a culture of flexibility, you must first reimagine what flexibility means today. Remember, to create behavior change, you need to allow for variance and creativity and agility. In other words, be "flexible" when creating a flexibility culture. A policy guide or a formal program can work against you. It seems counterintuitive, but having rules in place actually hinders the development of a truly authentic culture. At PwC, we loosely call it "everyday flexibility." It isn't something we mandate that all teams adopt; it's a mentality and a way of life that should be individualized for each person.

Retention

Flexibility for a caregiver might mean being able to leave work early to take an elderly parent to a doctor's appointment. For a parent, it might mean taking a midday run, so evenings can be spent with their children. And for others, it could simply be taking an hour in the afternoon to go to a yoga class and recharge. When we look at flexibility this way, it's easy to see why formal rules actually hinder adoption and progress. It's impossible to have a one-size-fits-all approach for flexibility. We let our teams figure out what works best for them, as long as they deliver excellent work, on time. The rest is all fair game.

Everyone deserves the same degree of flexibility. Flexibility is not related to a generational need. Every employee, at any age, benefits from and is looking for its availability. A culture of flexibility will not be created, adopted, or embraced unless the origination stems from an understanding and belief that every single person in the organization deserves the same consideration and flex work policies. This isn't about one segment of the workforce, so if you're sending out any kind of internal communications materials about flexibility, make sure it speaks to all employees. After all, we are a diverse workforce made up of diverse people, from working moms and dads to thousands of others without children who also want flexibility. One person's reasons for needing flexibility are not any more important or any less important than any another person's.

When it comes to flexibility, trust is *not* earned. It is not uncommon for managers to tell me that they believe in allowing employees to work flexibly, if and only when they've been with the firm a certain amount of time and earned that trust. This is when I remind people that we place our trust in employees from the moment they start working for us, so why wouldn't that same theory apply when it comes to flexibility? If you trust an individual enough that you hired them to join your organization, you also should trust them to get the work done when and where they prefer, as long as they meet deadlines. I challenge all managers to take this approach.

Flexibility is a two-way street. A strong culture starts from the very top. For example, when our CEO started wearing jeans to work, it sent a message to all of our people that it's okay to dress casually. That said, that is only where it starts. The *action* comes from the bottom up.

I often travel to speak to groups of our newly promoted senior associates. For most of these individuals, this is the first time they are stepping into a supervisory role. At the same time, they are still being supervised. They have a unique opportunity to empower direct reports, while putting pressure on managers to do the right thing for their teams. In these moments, I am reminded of the tremendous power our people hold in strengthening flexibility across the firm.

For us, flexibility is not about working less, but it is about encouraging people to work differently. It's a two-way street. We give our people the flexibility they need when they need it, and sometimes, we need them to give more when business demands require it. When done right, flexibility results in a happier, healthier, and more productive workforce. And it helps attract the best employees, and makes them want to stick around.

Anne Donovan is the U.S. People Experience Leader at PwC (PricewaterhouseCoopers), where she is a key senior leader responsible for strategy and innovation around culture change. She has a strong background in operational effectiveness and in engaging people to lead positive change.

Microcontroller Workshop

IEEE SE Michigan Computer & Education Section
Presents
"Micro-Controller Debug Training Workshop"

IEEE Southeastern Michigan Section Computer Society and Education Society are happy to announce, the 2020 Micro-Controller Debug Training Workshop. This is reprised edition of the 2019 event, however it is now being held **virtually** and spread over **2 evening sessions**.

The objective is to train Software Engineers & Students to debug basic microcontroller problems by providing the participants standard root cause analysis procedures. We will be using the Infineon AURIX™ Microcontroller Family to solve problems in a structured manner. There is no cost to attending the event. First preference will be given to existing IEEE members. We invite those who wish to attend to use the link provided, to confirm their seat. You need to attend both sessions in order to gain the full experience (CEU/PDH is available only upon request).

Pre-Registration Required!

https://events.vtools.ieee.org/m/230828

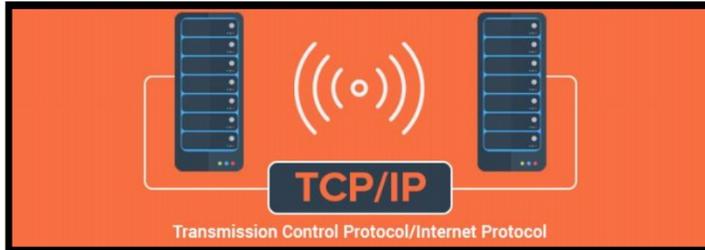---

At Glance

- **When:**
  Date: June 16 and
       June 23rd, 2020
  Time: 6:00 – 8:00 PM

- **Where:**
  Online via Webex (to be shared only after you have a confirmed registration)

- **Audience:** All eligible members and potential members (only if slots available)
  *

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SE Michigan Section
Computer Society,
Education Society
&
Infineon*

Chapter 5 TCP/IP Tutorial

IEEE SE Michigan Section
Presents
"Basic Introduction to TCP/IP networking"

TCP/IP
Transmission Control Protocol/Internet Protocol

IEEE
Southeastern Michigan
Electrical and Electronic Engineers Creating Our Future

IEEE Southeastern Michigan Section Computer Society and Education Society are happy to announce its weekly technical meeting/webinar: featuring the topic: "The Anatomy of TCP/UDP/IP protocols: how data packets wander thru the Internet". The topic is currently of keen interest to IEEE members, enough to make sense and trouble shoot using first principles. In addition, this will help highlight the basic networking principles for future Embedded System developers who will need to know this – in order to create successful IoT-based products. There is no cost to attending the event. However, we encourage all those attending to consider becoming an IEEE Member.   For a complete description of the Member process and its benefits:
https://www.ieee.org/membership/benefits/index.html

We also invite those who attend or plan to attend to use the link to provide suggestions for future topics of their interest.

At Glance

- **When:**
  Date: June 11, 2020
  Time: 6:00 PM – 7:25 PM

- **Where:**
  Online via Jit.si (to be shared only after you have registered)

- **Audience:** All Eligible Members, Senior members and Potential Members

*

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Pre-Registration Required!

https://events.vtools.ieee.org/m/230294

IEEE COMPUTER SOCIETY
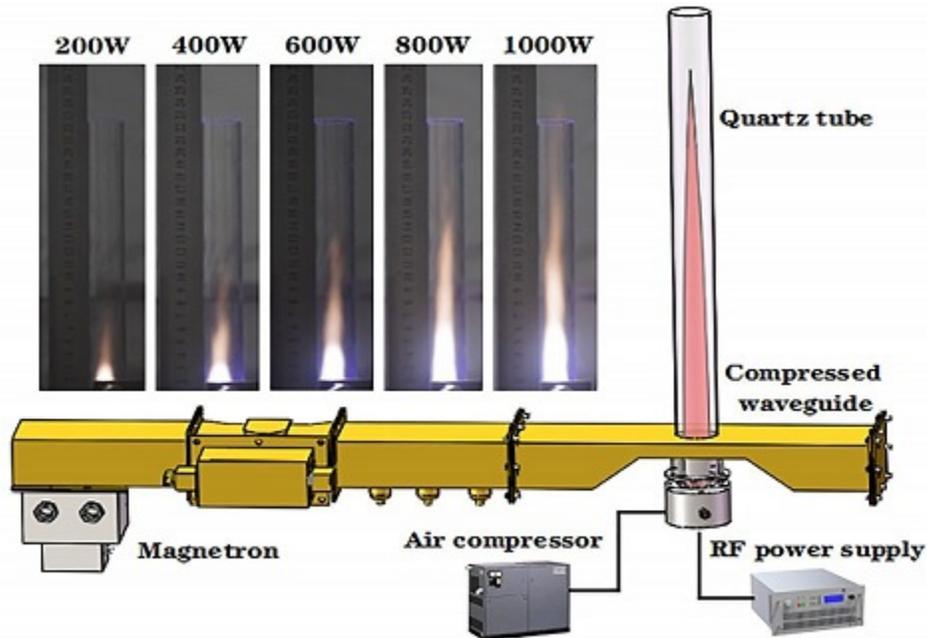
IEEE
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Potential Jet Engine?

Fossil Fuel-Free Jet Propulsion with Air Plasmas

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WASHINGTON, May 5, 2020 — Humans depend on fossil fuels as their primary energy source, especially in transportation. However, fossil fuels are both unsustainable and unsafe, serving as the largest source of greenhouse gas emissions and leading to adverse respiratory effects and devastation due to global warming.

A schematic diagram of a prototype microwave air plasma thruster and the images of the bright plasma jet at different microwave powers. This device consists of a microwave power supply, an air compressor, a compressed microwave waveguide and a flame ignitor.

A team of researchers at the Institute of Technological Sciences at Wuhan University has   demonstrated a prototype device that uses microwave air plasmas for jet propulsion. They describe the engine in the journal AIP Advances, from AIP Publishing.

"The motivation of our work is to help solve the global warming problems owing to humans' use of fossil fuel combustion engines to power machinery, such as cars and airplanes," said author Jau Tang, a professor at Wuhan University. "There is no need for fossil fuel with our design, and therefore, there is no carbon emission to cause greenhouse effects and global warming."

Beyond solid, liquid and gas, plasma is the fourth state of matter, consisting of an aggregate of charged ions. It exists naturally in places like the sun's surface and Earth's lightning, but it can also be generated. The researchers created a plasma jet by compressing air into high pressures and using a microwave to ionize the pressurized air stream.

This method differs from previous attempts to create plasma jet thrusters in one key way. Other plasma jet thrusters, like NASA's Dawn space probe, use xenon plasma, which cannot overcome the friction in Earth's atmosphere, and are therefore not powerful enough for use in air transportation. Instead, the authors' plasma jet thruster generates the high-temperature, high-pressure plasma in situ using only injected air and electricity.

The prototype plasma jet device can lift a 1-kilogram steel ball over a 24-millimeter diameter quartz tube, where the high-pressure air is converted into a plasma jet by passing through a microwave ionization chamber. To scale, the corresponding thrusting pressure is comparable to a commercial airplane jet engine.

By building a large array of these thrusters with high-power microwave sources, the prototype design can be scaled up to a full-sized jet. The authors are working on improving the efficiency of the device toward this goal.

"Our results demonstrated that such a jet engine based on microwave air plasma can be a potentially viable alternative to the conventional fossil fuel jet engine," Tang said.

###

For more information:
Larry Frum
media@aip.org
301-209-3090

References:

1. Jet propulsion by microwave air plasma in the atmosphere, Dan Ye, Jun Li and Jau Tang (Authors), published in the AIP (American Institute of Physics) Journal: AIP Advances, *https://aip.scitation.org/doi/full/10.1063/5.0005814*
2. Wait, Could Plasma Thrusters Really Replace Jet Engines? *Scientists just demonstrated a promising prototype— with a catch*, Popular Mechanics, https://www.popularmechanics.com/science/a32405613/microwave-air-plasma-thrusters-compete-jet-engines/
3. Microwave thruster makes for clean-burning jet, *Air-burning plasma thruster may be competitive with jet engines*, by Chris Lee, Ars Technica*,* https://arstechnica.com/science/2020/05/microwave-thruster-makes-for-clean-burning-jet/
4. Scientists unveil fossil fuel-free jet propulsion that uses microwave air plasmas, by Brooks Hays, UPI Science News, *https://www.upi.com/Science_News/2020/05/06/Scientists-unveil-fossil-fuel-free-jet-propulsion-that-uses-microwave-air-plasmas/2621588762079/*

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Sharan Kalwani,
Wavelengths,
2017 ~ 2020

ESD Gold Awards

GOLD AWARD
RECEPTION & RECOGNITION
2020

FEATURING
Gold Award
Affiliate Society Awards

SAVE THE DATE

September 16, 2020 · 5:30 P.M.
2020 Gold Award Recipient
Dr. Arup Gangopadhyay
Nominated by
The Society of Tribologists and Lubrication Engineers (STLE)

ESD
THE ENGINEERING SOCIETY OF DETROIT®
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GOLD AWARD

RECEPTION & RECOGNITION 2020

Join the ESD Affiliated Technical Societies as we come together to honor and recognize our leaders – engineers, scientists and technical professionals who have distinguished themselves through outstanding achievement and service within their respective Societies.

Hosted by The Engineering Society of Detroit and its Affiliate Council, the event will feature this year's Gold Award winner. This award is given to an individual who is collectively upheld by the council for his or her outstanding contributions to the fields of science and engineering.

PROGRAM

September 16, 2020
Location TBD

5:30 PM
Strolling Reception

6:45 PM
Awards Program

COST

Before August 31:
$60 per person or $55 per person for 5+ reservations

August 31 and After:
$75 per person or $70 per person for 5+ reservations

$35 per student (no alcohol)

Cost includes:
A variety of hors d'oeuvre stations, beer and wine.

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Register online at www.esd.org or by phone at 248.353.0735

ORG UNITS cheat sheet

Section Unit Name or Affinity Group or Chapter Name (Organizational Unit is in parentheses)
Consultants Network Affinity Group: (CN40035)
Life Members:
Young Professionals:
Women in Engineering:
Chapter: 01   (SP01) Signal Processing Society, (CAS04) Circuits and Systems Society and (IT12) Information Theory Society
Chapter: 02   (VT06) Vehicular Technology Society
Chapter: 03   (AES10) Aerospace and Electronic Systems Society and (COM19) Communications Society
Chapter: 04 "Trident" (AP03) Antennas and Propagation Society, (ED15) Electron Devices Society, (MTT17) Microwave Theory and Techniques Society,
Chapter: 05 "Computer" (C16) Computer Society
Chapter: 06   (GRS29) Geosciences and Remote Sensing Society
Chapter: 07   (PE31) Power Engineering Society, (IA34) Industrial Applications Society
Chapter: 08 "EMC"   (EMC27) Electromagnetic Compatibility Society
Chapter: 09   (IE13) Industrial Electronics Society, (PEL35) Power Electronics Society
Chapter: 10   (TEM14) Technology and Engineering Management Society
Chapter: 11   (EMB18) Engineering in Medicine & Biology
Chapter: 12   (CS23) Control Systems Society
Chapter: 13   (E25) Education Society
Chapter: 14   (RA24) Robotics And Automation Society
Chapter: 15   (NPS05) Nuclear Plasma Sciences Society
Chapter: 16   (CIS11) Computational Intelligence Society, (SMC28) Systems, Man and Cybernetics Society
Chapter: 17   (NANO42) Nanotechnology Council
Section Unit Name or Affinity Group or Chapter Name (Organizational Unit is in parentheses)
University Of Detroit-Mercy: (STB00531)
Michigan State University: (STB01111)
University Of Michigan-Ann Arbor: (STB01121)
Wayne State University: (STB02251)
Lawrence Technological University: (STB03921)
Oakland University: (STB06741)
Eastern Michigan University: (STB11091)
University of Michigan-Dearborn: (STB94911)

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Sharan Kalwani,
Wavelengths,
2017 ~ 2020

Non-IEEE Events

We try to publish IEEE events in several places to ensure that everyone who may want to attend has all the available relevant information. **NOTE: The IEEE SE Michigan section website is changing to its new home, kindly make a note of it! The new home is located at http://r4.ieee.org/sem/.** The old links will continue to work for some time, but will be changing permanently in the near future.

SEM e-Wavelengths:
www.e-wavelengths.org
This is our 'Active' event listing site where everyone should look first to see what events are scheduled for our Section in the near future.

SEM Web Calendar:
http://r4.ieee.org/sem/
Select "SEM Calendar" button in the top row of the website.

SEM Web Meetings:
http://r4.ieee.org/sem/
Select "SEM Meeting List" button in the left-hand column.

vTools Meetings:
http://sites.ieee.org/vtools/
Select "Schedule a Meeting" button in the left-hand column of buttons.

Other IEEE Local Meetings:
http://www.e-wavelengths.org/

Other Happenings

Here are some of the non-IEEE events that may be of interest to you or someone you know. Let us know if you have a special interest in a field that encourages technical study and learning, and wish to share opportunities for participation with members of the section.

Send details to: wavelengths@ieee-sem.org

Michigan Institute for Plasma Science and Engineering: Seminars for the 2018-2019 academic year: http://mipse.umich.edu/seminars.php

Model RC Aircraft
http://www.skymasters.org/

Model Rocketry
http://team1.org/

Astronomy
http://www.go-astronomy.com/astro-clubs-state.php?State=MI

Experimental Aircraft Association
https://www.eaa.org/en/eaa/eaa-chapters/find-an-eaa-chapter

Robots
http://www.therobotgarage.com/about-us.html

Science Fiction Conventions
https://2019.penguicon.org/

http://www.confusionsf.org/

Mad Science
http://www.madscience.org/

ESD PE Review Class
https://www.esd.org/programs/pe/

Maker Faire:
https://swm.makerfaire.com/

Executive Committee

The SEM Executive Committee is the primary coordination unit for Southeastern Michigan (SEM) IEEE operations. The basic organization chart below shows the 2019 arrangement of communications links designed to provide inter-unit coordination and collaboration.

The SEM Executive Committee meets in a teleconference each month on either the first Wednesday or first Thursday at noon. The specific meeting days, times, phone or WebEx numbers and log in codes are published on the IEEE SEM Website calendar: **http://r4.ieee.org/sem/**　Click on the "Calendar" button in the top banner on the first page of the web site.

If you wish to attend, or just monitor the discussions, please contact Christopher Johnson, the section secretary at: **cgjohnson@ieee.org** and request to be placed on the distribution list for a monthly copy of the agenda and minutes.

More meeting details are available on the next page of this newsletter.

Other Meetings:
About half of our members maintain memberships in one or more of the IEEE technical societies, which automatically makes them members of the local chapter which is affiliated with that society. As a result, they should receive notices of the local chapter meetings each month.

However, members of the section may have multiple technical interests and would like to have meeting information of other chapters. In order to communicate the meeting dates of all the chapters, affinity groups etc., to our members to facilitate their attendance, leaders of the groups are requested to send meeting information to our webmasters for posting on section's calendar.

More detailed information on meetings may be found through the IEEE SEM Website: **http://r4.ieee.org/sem/** and clicking on the **SEM meetings list** button near the bottom of the left-hand banner.

Automatic e-mail notification of web updates may be received using the "**Email Notifications**" button at the top of the **SEM Tools/Links** side banner.

Christopher Johnson - SEM Secretary

Download the complete SEM Organization Chart, in PDF format, from our Website at: http://r4.ieee.org/sem/
Click on "About SEM" Tab and "Current Officers" *(NOTE: this is now password protected)*
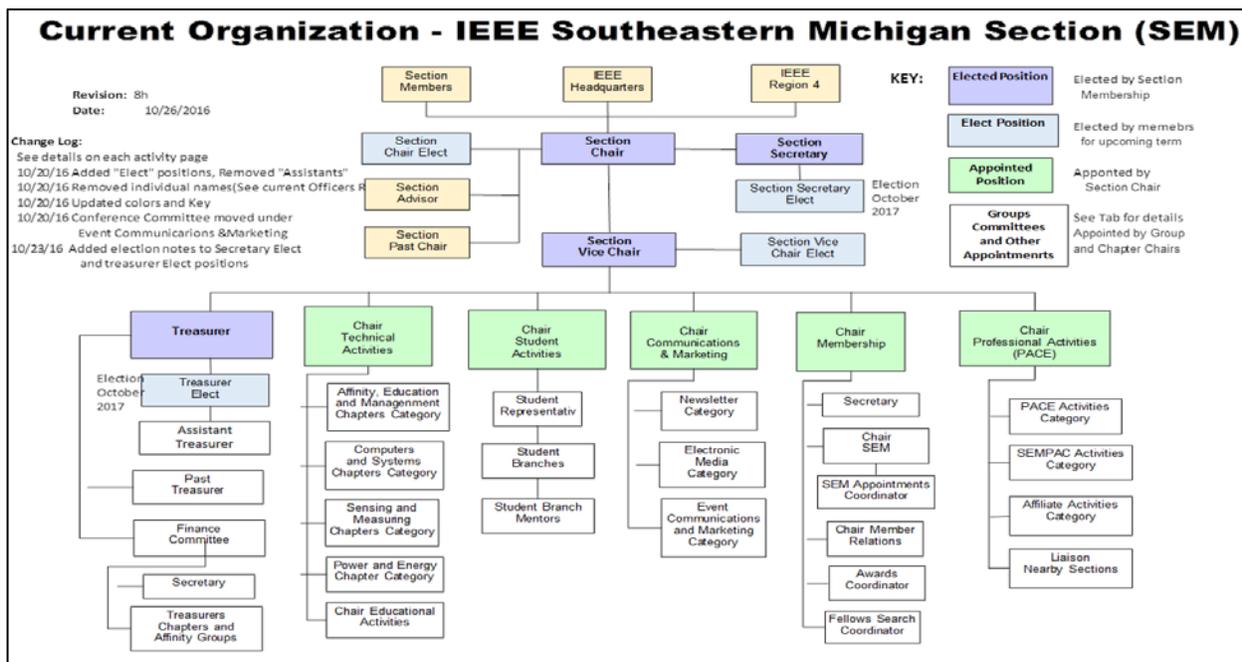
ExCom Meeting Schedule

Below is the 2020 schedule for the Section ExCom meetings with links to add the events to your calendar. It is important that at least one person from each Chapter/Affinity Group attends each scheduled ExCom meeting. Information on each Face-to-Face (in-person) Meeting will be sent out once the venue is confirmed.

Please mark your calendars for the 2020 meetings. Or, link your personal calendar to the SEM Web calendar.

Section Administrative Committee (ExCom) Meeting Schedule for 2020:

Note: All IEEE Members are welcome at any IEEE meeting, at any time but please register so we can be sure to accommodate you. This month's meeting is highlighted in **Bold**.

Teleconference, Thursday June 4 https://events.vtools.ieee.org/m/216754

FACE TO FACE, Wednesday July 8 **https://events.vtools.ieee.org/m/216970**

Teleconference, Thursday August 6 **https://events.vtools.ieee.org/m/216755**

Teleconference, Wednesday September 2 **https://events.vtools.ieee.org/m/216756**

FACE TO FACE, Thursday October 7 **https://events.vtools.ieee.org/m/216971**

Teleconference, Wednesday November 4 **https://events.vtools.ieee.org/m/216759**

Teleconference, Thursday December 2 **https://events.vtools.ieee.org/m/216760**

Chris Johnson
SEM Secretary
cgjohnson@ieee.org

Editor's Corner

Previous editions in this series may be found on the IEEE SEM website at: http://r4.ieee.org/sem/. Click on the "Wavelengths" button in the top row of selections.

Comments and suggestions may be sent to the editorial team at wavelengths@ieee-sem.org
OR
sharan.kalwani@ieee.org
nilesh.dudhaia@ieee.org
k.williams@ieee.org
cgjohnson@ieee.org

We rely on our officers and members to provide the 'copy' that we finally present to readers of the newsletter. The **Wavelengths Focus Plan and Personal Profiles** plan shown in the matrix below is presented to ensure coverage of section activities and events.

We try to complete the newsletter layout a week before the first of the month to allow time for review and corrections. If you have an article or notice, please submit it two weeks before the first of the month or earlier if possible.

The plan below relies on the contributions of our members and officers, so please do not be shy. If you have something that should be shared with the rest of the section, we want to give you that opportunity.

Editors:

We are always looking for members interested in helping to edit the newsletter. The process is always more fun with more people to share the duties. Having more participants and contributors also helps us keep the newsletter interesting.

Heads Up

We are contemplating making the submissions of articles and events for the Wavelengths, a little easier and a little more inviting. Ideas are of course welcome and to this end, we are toying with setting up a little "newsletter portal". Stay tuned for some news on that end!

Join the Team:

If you feel you might like to join the team, or would like to train with us, please contact one of us at: wavelengths@ieee-sem.org OR any one of the following:

sharan.kalwani@ieee.org
nilesh.dudhaia@ieee.org
k.williams@ieee.org
cgjohnson@ieee.org

Wavelengths Annual Publication Plan for Articles

Month	AG's	Ch's	Ch's	SB's	Special Notice	Reporting Events	Monthly Focus	Awards
Jan		1		OU	Future Cities Judges	Election Results	Resolutions	
Feb	Cons	2		MSU	Science Fair Judges	Officer's Welcome	Surviving Winter	Future Cities
Mar		3	13	EMU	Spring Conf. Flyer	Spring Conference	Spring Conference	Science Fair
Apr		4		U/M-D	National Engrs Wk.	Future Cities	Chapter Focus	ESD - GOLD
May	Life	5	14		Outstanding Eng Awd	Science Fair	Elections - Prep	New Fellows
Jun		6			IEEE-USA Apmts.	ESD Banquett	Leadership Skills	SEM Awards
Jul		7	15		Nominations Call	MD-Webcasts	Students Issues	Region 4
Aug	WIE	8			MGA - Apmts.	Tech-Webinars	Womens Issues	
Sep		9	16	LTU	Region 4 Apmts.	Engineers Day	Professional Skills	
Oct		10		U/M-AA	Fall Conf. Flyer		Fall Conference	
Nov	YP	11	17	WSU	ELECTIONS!		Humanitarian	
Dec		12		U/D-M	IEEE-Com Apmts.	Fall Conference	Happy Holidays	

Wavelengths Annual Publication Plan for Personal Profiles

Month	Profiles	Profiles	Committees
Jan	Chair	New Officers	
Feb	V-Chair	Secretary	Communications
Mar	Treasurer	Sect-Adviser	Conference
Apr	Stud-Rep		Education
May		Sr Officers	Executive
Jun			Finance
Jul			Membership
Aug			Nominations
Sep			PACE Activities
Oct			Student Activities
Nov			Technical Activities
Dec		Editor-WL	

Web & Social Sites

SEM Website
http://r4.ieee.org/sem/

Each of the sites below may be accessed through the SEM Website:

Section Website Event Calendar
(Select the "SEM Calendar" button - top row.)

SEM Facebook Page
(Select the " f " button under the top row.)

SEM LinkedIn Page
(Select the " in " button under the top row.)

SEM Officers:
For a complete listing of all - Section - Standing Committee - Affinity Group - Chapter and Student Branch Officers, see the SEM Officers Roster on the SEM web page under the "About SEM" button and select "Current Officers."

Section Officers

Section Chair
David Mindham

Section Secretary
Chris Johnson

Section Vice-Chair
Sharan Kalwani

Section Treasurer
Michael Folian

Standing Committees:
Section Adviser
Don Bramlett

Chair Communications & Marketing

Chair Educational Activities
Christopher Guirlanda

Chair Finance
Nevrus Kaja

Chair Membership Development
Sharan Kalwani

Chair Nominations & Appointments
Kimball Williams

Chair Professional Activities (PACE)
Sharan Kalwani

Chair Student Activities
Mel Chi

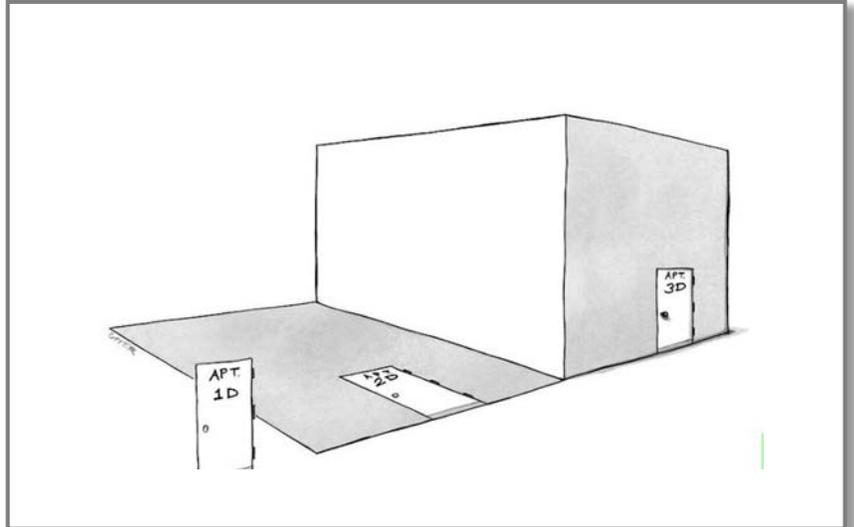**Student Representative**

Chair Technical Activities
Jeffery Mosley

IEEE Southeastern Michigan

Electrical and Electronic Engineers Creating Our Future

IEEE Southeastern Michigan

Visit Us on the Web at:
http://r4.ieee.org/sem

Leadership Meetings

SEM Executive Committee Monthly Teleconferences:
- 1st Wednesday or Thursday of Each Month @ Noon
- Check the Section Web Calendar at:
  http://r4.ieee.org/sem/sem-calendar/
  (Select the "SEM Calendar" button in the top row.)

SEM Executive Committee Face-to-Face Meetings:
- Once every Qtr. Find the location, and Registration at:
  https://meetings.vtools.ieee.org/main

SEM Standing Committee Meetings:
SEM Affinity Group Meetings:
SEM Technical Society/Chapter Meetings:
SEM University Student Branch Meetings:
- Meeting schedules are announced on SEM Calendar
  http://r4.ieee.org/sem/
  (Select the "SEM Calendar" button in the top row.)

- Registration for all at:
- **https://meetings.vtools.ieee.org/main**