Wavelengths

Volume 62 – Issue 07

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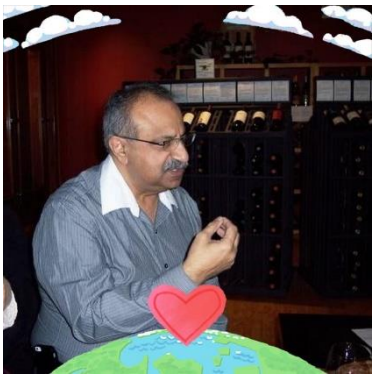
Upcoming Events

We have fewer events coming up this month, all are listed below, FYI.

Event	Date	Time
SEM Section ExCom Monthly Meeting (In-Person +virtual) for July 2022	07/07/2022	6:30 PM
Ch8: AdCom Teleconference	07/14/2022	11:00 AM
The Use of Synchrophasors to Understand What Happened to the Power Grid During the Winter Storm Uri Event	07/21/2022	11:30 AM
EMC Society Picnic	07/21/2022	05:30 PM
Growing Role of Machine Learning in Automotive Technology	07/14/2022	06:00 PM

Note: All times are EST/EDT. If any events are missed do kindly bring them to the attention of wavelengths@ieee-sem.org. Thank you!

Chair's Column



This is the 6th column I am now sharing with all of our IEEE Southeastern Michigan community.

I am looking forward to the first F2F ExCom meeting of the year! I do hope to see as many of you as possible.

July is traditionally a slow month, so take the time to enjoy the outdoors and start thinking of volunteering or contributing for the Fall.

This month marks the return of "Engineering milestones I did not know of this during the Month" series, They first featured in 2018.

EMC Society is planning a picnic on July 21st. I shall be there in person. If folks want to hold a section wide picnic, I suggest you get in touch with our M Berri (vicechair@ieee-sem.org).

Sharan Kalwani
Via email: chair@ieee-sem.org

Section members are encouraged to engage using <u>any</u> of these online platforms:

Technical Activities Report

2022 IEEE SE Michigan Section Geo-unit Status (Till June 30th)

Ch's & AG's	Ave Tech Mtg. Attend	Ave Tech Mtg Guest	#L31 -Technical	#L31 -Admin	#L31 Professional	#L31 -Other	Geo-Unit Name	# Unreported	Total Mtgs
Cnslt	11	3	1	0	1	0	Consultants Network	0	2
LIFE	0	0	0	0	2	0	Life Members	0	2
WIE	14	1	2	5	0	0	Women In Engineering	0	7
YP	0	0	0	0	0	0	Young Professionals	0	0
1	78	0	1	0	0	0	Circuits & Systems, Signal Proc., Info Th.	0	1
2	78	0	1	1	0	0	Vehicular Technology	0	2
3	0	0	0	0	0	0	Aerospace & Elec. Sys., Communications	0	0
4	0	0	0	0	0	0	Trident (Ant, Elect Dev., uWave, Photo)	0	0
5	30	7	23	1	1	1	Computers	0	26
6	0	0	0	0	0	0	Geoscience & Remote Sensing	0	0
7	0	0	0	4	0	0	Power Engineering, Industrial App.	0	4
8	59	41	7	6	0	1	Electromagnetic Compatibility (EMC)	0	14
9	24	4	3	1	0	0	Power Electronics, Industrial Electronics	0	4
10	6	2	2	0	0	0	Engineering Management	0	2
11	55	37	1	2	0	0	Eng. in Medicine & Biology	0	3
12	0	0	0	0	0	0	Control Systems	0	0
13	14	3	10	1	0	1	Education	0	12
14	0	0	0	0	0	0	Robotics & Automation	0	0
15	42	27	4	0	0	0	Nuclear Plasma Science Society	1	4
16	78	0	1	0	0	0	Computational Intelligence / Sys.Man.Cyber.	0	1
17	0	0	0	0	0	0	Nano Technology Council	0	0
SEM	39	5	4	12	2	0	SEM (Section)	2	18
	528	129	60	33	6	3	NOTE: Highlight Green = Active	3	102
		24%					NOTE: Highlight clear = Concern		

Per the accompanying report there are several chapters and affinity groups that are showing no activity. Chapter 15 Nuclear Plasma, please review vTools to confirm your currently unreported meeting via a L31 report. There is still a need to plan and conduct meetings before the end of this calendar year. GA leaders please reach out to the TAcom for any assistance. GA members if you have suggestions or requests for technical meetings please contact me via the email below.

Your TAcom plans to continue contacting chapters and groups needing assistance in meeting IEEE and SEM Section goals for encouraging member participation and discussions related to the vast amounts of technical and engineering challenges facing our world.

V/r

Jeffery V. Mosley, Chair, Technical Activities Committee, R4 IEEE SE Michigan, jvmosley@ieee.org

Election 2022

In the coming election, Southeastern Michigan will elect the following Section Executive Committee officers to begin their terms at the start of the new year:

- Section Chair – **Elect**,
- Section Vice-Chair – **Elect**.

Both of these new 'Elect' officers will serve the 2023 year 'in training' by 'shadowing' the current Chair and Vice-Chair and will assume their full office responsibilities on the first day of 2024.

This arrangement of 'staggered' officers with a year of training as 'Elect' officers followed by two years in the official office role has proved successful in establishing a continuity of programs and policies that have helped our Section become the most active in Region 4 (USA Upper Mid West).

Chapters & Affinity Groups:
All of our Chapters and Affinity Groups (Geo-units) elect their officers for a one year term, beginning at the first of January and ending at the end of December. This means that during the nomination process which will begin next month in August, all our members will have the opportunity to nominate a candidate for each office position in each of the local Geo-units they belong to.

Note: Any IEEE member who is also a member of any of the societies represented by one of our local Chapters or affinity groups is automatically a member of that local Geo-unit.

So, if you happen to be a member of 5 technical societies represented by a local SEM Chapter, you will have the opportunity to nominate officers to each of those Geo-units. You will also receive an election ballot for each of those local Geo-units to allow you to make your selection of nominated members to become an officer in that Geo-unit.

For each Geo-unit candidates are sought for the following elected posts:

Chair
Vice-Chair
Secretary
Treasurer

The qualifications, functions and duties for each of these positions is detailed in the SEM Webpage under the 'About SEM' TAB by clicking on the 'Volunteer Portal' and selecting the officer title of interest. It is wise to be sure that the person you nominate for an office understands and is capable of following through on the duties of the office and is willing to actually serve in that position. (*We don't need or want officers who seek a position just to put it on their CV or Resume' and the only action they engage in is to 'warm the seat' for a year*.)

Early in August, all IEEE members in our Section will have the opportunity to engage in the nomination process when they will receive an eNotice with a link to the survey form.

Note that it is up to each member to understand which Geo-unit or units they belong to through their selection of technical and social societies. To do this, review the 'Organization Roster' in the SEM webpage under the 'About SEM' TAB. Selecting that entry will allow you to download a PDF of the most recent version.

And remember that several of our Geo-units are 'joint' Chapters with more than one Society represented.
An excellent example is Chapter 4:

- Antennas and Propagation,
- Electron Devices,
- Microwave Theory & Techniques and
- Photonics

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2022 IAS Annual meeting

Invitation Message for 2022 IAS Annual Meeting

Dear Electrical Colleagues:

We are excited to invite your attendance and participation at the IEEE's 57th IAS Annual Meeting to be held October 9-13, 2022. The conference will be in Detroit, Michigan USA.

The IAS Annual Meeting has established a long tradition of providing a platform for practicing engineers, researchers, and technical experts to present and discuss current developments and future trends in applications of electrical technology to fields such as electrical standards, industrial and commercial power systems, data centers, process controls, robotics and automation, electrostatics, mining, metals, smart grid, smart cities, and smart manufacturing.

Our conference venue and meeting space will be at the world-class Detroit convention center, which has been newly renamed as "Huntington Place". City of Detroit is known for being historical birthplace of the modern automobile industry. Our IAS Annual Meeting will be co-located with the 2022 Energy Conversion Congress and Exposition (ECCE). IAS Annual Meeting delegates are invited to attend some selected ECCE activities, such as the Monday Plenary Session and the ECCE Technical Expo, which are open to attendees from both conferences. With such a great setting for our two conferences, there will be ample opportunities for attendees to enjoy social events and networking amongst other engineers, industry folks, academic faculty, and of course students.

Our "Call for Papers" with deadline dates has been posted on our conference website at: https://ias.ieee.org/2022annualmeeting/call-for-papers.html It incorporates a "Call for Tutorials" as well. And for more general information regarding the overall conference, please visit the conference website at: https://ias.ieee.org/2022annualmeeting

On behalf of the entire conference organizing committee, we look forward to your participation in the 2022 IAS Annual Meeting!

Sincerely,

David Eng
General Chair, IAS AM-2022
Email: engdd412@ieee.org

ECCE 2022

ECCE 2022 DETROIT

IEEE ENERGY CONVERSION CONGRESS & EXPO Detroit, Michigan, USA Oct. 9-13

IMPORTANT DATES

January 15, 2022
Digest submission

May 1, 2022
Author notification

July 1, 2022
Final papers with IEEE copyright forms

IEEE

IAS IEEE INDUSTRY APPLICATIONS SOCIETY Linking Research to Practice

pels IEEE POWER ELECTRONICS SOCIETY Powering a Sustainable Future

General Chair
Emmanuel Agamloh
Baylor University, USA

ECCE 2022 Technical Program Co-Chairs
Navid R. Zargari
Rockwell Automation, Canada

Annette Muetze
Graz University of Technology, Austria

Andrea Cavagnino
Politecnico di Torino, Italy

Mohammad Islam
Halla Mechatronics, USA

Gerry Moschopoulos
University of Western Ontario, Canada

Brandon Grainger
University of Pittsburgh, USA

Contact email:
ecce2022tpc@gmail.com

The Fourteenth Annual IEEE Energy Conversion Congress and Exposition (ECCE 2022) will be held in Detroit, Michigan, USA, from October 9 to October 13, 2022. ECCE is a pivotal international event on energy conversion. ECCE 2022 will feature both industry-driven and application-oriented technical sessions as well as an exposition. The conference will bring together practicing engineers, researchers and other professionals for interactive and multidisciplinary discussions on the latest advances in areas related to energy conversion.

Technical papers are solicited on any subject pertaining to the scope of the conference including, but not limited to, the following major topics:

Energy Conversion Systems & Applications

- High power/voltage power conversion
- High voltage isolation techniques
- Energy harvesting
- Energy conversion for information technology and communication systems
- Energy efficiency for residential, commercial, and industrial applications
- Big data and artificial intelligence in energy conversion
- Renewable and alternative energy power electronic systems
- Smart grids, microgrids, and utility applications (HVDC, FACTS, and Solid State Transformers)
- Electrical energy storage
- Wireless power transfer

Component, Converter & Subsystem Technologies

- Power electronic devices (silicon and wide bandgap) and applications
- Passive components and materials
- Power electronic packaging integration
- Reliability, advanced fault protection systems, diagnostics, prognostics, and health management
- Thermal management and advanced cooling technologies
- Electromagnetic interference and electromagnetic compatibility
- Power conversion topologies, modulation, and control
- Electrical drive systems and topologies and their control
- Rotating/linear electromechanical devices
- Enabling technologies for Industry 4.0: advanced manufacturing, additive manufacturing, digital twins, cloud design, big data analytics

Digest Submission: Prospective authors are requested to submit a single column, single spaced digest no longer than five (5) pages summarizing the proposed paper. The digest should include key equations, figures, tables, and references as appropriate, but no author names or affiliations. Digests not conforming to these requirements will be rejected without review. The digests must clearly state the objectives of the work, its significance in advancing the state of the art, and the methods and specific results in sufficient detail. All digests will go through a double-blind peer review process to ensure a confidential and fair review. The papers presented at the conference will be included in the IEEE Xplore Digital Library. Please refer to the conference website for a detailed list of technical topics and the digest submission method.

www.ieee-ecce.org/2022 Detroit, Michigan, USA – October 9–13, 2022

Disconnected?

On occasion I run into an IEEE member who complains to me that they no longer receive any notices of Section or Geo-unit (Affinity Group or Chapter) activities, and they don't understand why we no longer publish our Section newsletter.

Most often these problems can be traced back to two likely situations:

- The member forgot to renew their membership, or
- They changed the settings in their IEEE Personal Profile.

Renewals:
If a member fails to renew their membership in IEEE, after the yearly 'cut off' period, (usually about the end of February), all communications with any and all IEEE entities is terminated.

When a member does not renew, there is really only one way that IEEE can interpret that action. It is a clear statement from the former member that they don't want to be bothered with IEEE, and IEEE must respect that message.

Profile:
At times the demands of life, work, family and community become so intense that members enter the main IEEE website, click on their name at the top of the opening screen (after logging in) and are directed to the personal profile page. One of the selection possibilities on that page is labeled "Communication Preferences, and Policies".

The list of selections is comprehensive, and one that stands out is:
'Please remove me from IEEE communications not required legally or for the fulfillment of services.'
When someone selects this option, it does exactly what it says and stops any and all IEEE communications except for those few that are needed to satisfy 'legal' requirements.

At that point, only direct communication that does not flow through the IEEE communication and coordination systems is cut off. If someone has your IEEE email account information they can send direct email to you but any announcements of events, meetings, appointments, eNotices, Newsletters, updates, etc. is terminated.
i.e. you are 'cut out of the loop'.

Yearly Review:
Life, work, family and community situations are in constant flux. A decision made due to a particular combination of circumstances may have been appropriate at one time but as multiple factors change it is wise to regularly review your decisions, and your IEEE Personal Profile selections to determine if those selections are still valid. At one time I would have recommended that once a year all IEEE members should review all of their selections both for communications as well as their Society or Affinity Group memberships. However the constant upheaval that has become a characteristic of our post pandemic society suggests that a more frequent assessment may be more appropriate.

We are now at the halfway point through 2022. Now would be a good time to do that review of your Personal Profile. Repeat that review also when you renew your membership near the end of this year.

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A job for all

"What do you want to be when you grow up?" is a question posed to many young people long before they have any clear understanding of what opportunities and options might become available to them. (*Personally, I say to myself "I wonder what I will be **if** I ever grow up."*)

Talking with professional musicians I often hear them make the statement "I get to play music all the time, and they actually pay me to do it!" I hear similar things from engineers and technicians about all the great 'toys' (read "expensive complicated scientific equipment") they give me to play with, and they pay me to do it!

The world we live in may not be perfect but, having a job that allows you to have fun all day long and 'play' with others who enjoy the same opportunities can come much closer to the 'ideal'. The problem comes with trying to find that job among all the other options presented to you. I always find that a 'hands on' introduction to anything gives me a more reliable insight into the pros and cons of the subject 'de jour'. I can read lots of material and talk to folks involved in the subject, but nothing seems to clarify the essence as clearly as actually 'doing' the work. This is probably why universities with strong 'Work / Study' programs that offer 'internships' in industrial or research companies have such a high graduate success rate with students who are happy with their final job selection.

Some IEEE members also aspire to eventually go into management. Many engineers find themselves 'pushed' into management when their experience gives them that 'broad balanced view' of their technology and work place. Some self select themselves into management functions because they see what needs to be done and no one else seems to understand or be willing to take on the challenge. So, how would someone 'intern' for a management position?

'Management' as a 'job' entails a number of specialized skill sets that can best be 'learned by doing'. OK but what can provide the opportunity to 'do' those skills? Fortunately, your engineering society (*yes, I do mean IEEE, but there are others*) has 'jobs' that give us the opportunity to learn and practice many of the basic skills that will eventually be required of someone in a management position. (Team building / Organization / Delegating & Follow up / Communication / Public Speaking / Accounting / Time Management / Long range planning / Clear writing / Conducting meetings / Record keeping / Training assistants / Learning to 'let go' when someone else can do a better job / etc. etc.).

These skill sets are similar to learning how to ice skate. Some understanding of the basics can be gotten by research and reading but, to fully master the skill requires actually getting out in the ice and falling down a few times as you gain the necessary experience. You have to 'do' the job to 'learn' the job.

So, where within IEEE do you find these opportunities? In the many organizational units that make up the IEEE structure.

- Volunteer with a Student Branch to do a simple job just to 'get your feet wet'.
- Look through the list of Section level Standing Committees to find something that interests you and let the leadership team know you want to help.
- Nominate yourself for an office or a supporting role for one of the Chapters or Affinity Groups.

In an 'ideal' experience situation you should find yourself handling different roles over a period of time, or different roles for different organizations. With luck and planning, it would be best to have experience in every possible officer and support position in the organization. That way you would truly 'know' what each requires and how each is intended to interact with all the others.

So where do you find these opportunities? In the SEM Website under the 'About SEM' TAB. Look for the Organization Roster to find the current and future opportunities. Look for the 'Volunteer Portal' for job descriptions of each identified position. Also, use the Organization Roster to contact the leadership team of any opportunities that catch you eye.

Good luck on your journey. I feel sure you are going to have a great time and learn much more than you might imagine at this point.

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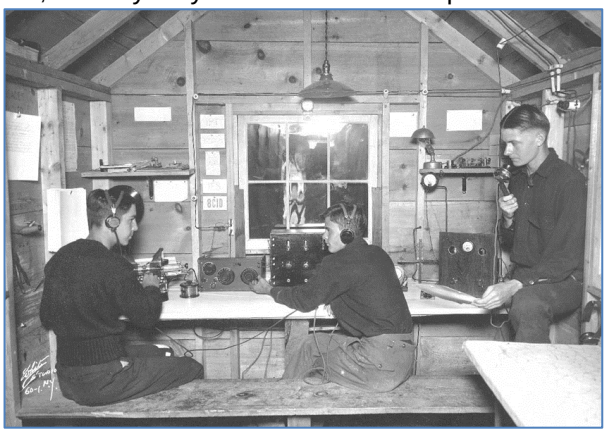
Field Day

As you read this in our July issue of Wavelengths the 2022 Amateur Radio Field Day will be in the record books. Beginning in 1933, Field Day is one of the oldest and most popular events for Amateur Radio Operators (Hams) and was initially intended for US and then also Canadian Hams as a practical application exercise in setting up a communications station away from the normal station site and confirming its operation by making 'contacts' with other Hams, and developing skills at handling messages rapidly and accurately under 'difficult' conditions. This activity support one of the 5 basic reasons why the US Federal Government maintains the Amateur Radio 'Service' Support for emergency communications.

I hope some of our readers were able to join with Amateur Radio clubs around our Section and experience Field Day first hand.

OK, but why do you Amateur Radio Operators refer to yourselves as 'Hams'? How did that begin?



Well…. In the early days of Amateur Radio three experimenters with last names Beginning with "H" "A" and "M" had self assigned their station call sign as "HAM".

(This was long before the establishment of formal licenses for radio stations, and amateur radio stations were being built by experimenters all over the country.)

Early government efforts at control amounted to a draconian use of force and an edict to shut down this 'HAM' station.
They received national attention when their congressman defended their 'right' to use the airwaves. Congress agreed, and the term "HAM" has stuck with Amateur Radio ever since.

"Ok, its historical, and perhaps fun if you are a radio geek, but, why all this effort to build equipment, operate in uncomfortable situations to send messages using 'old fashioned' technology when everyone can call anyone else using their cell phone?"

The whole purpose of 'Field Day' is to be sure that someone can contact someone else outside of the 'crater', or epicenter of some tragic disaster event. Remember we still live on a planet with earthquakes, hurricanes, volcanoes, tornados, tsunami, floods, and wildfires that can take out our power infrastructure and all our 'modern' communications systems, like cell phones along with it. To prepare for those possible disaster 'emergency' situations when we can lose those communications systems we have come to take for granted. So, as the Amateur Radio poster says: "**When all else fails, Amateur Radio**.".

And, to make sure that messages in an emergency are handled quickly, efficiently and accurately, the 'Ham' community supports the 'National Traffic System', which passes messages every day using Ham radio to send birthday and anniversary greetings, congratulations on graduation, or a new baby, or marriage, or any number of 'routine' messages. This constant activity of passing 'trivial' messages ensures that the stations, operators and skills are up to standard so that, not if but when an emergency occurs, all the systems operate and usual, and get the message through without error or distortion.

During the 2016 "Cascadia Rising" Federal disaster exercise, radiotelegraph (CW) traffic nets successfully demonstrated superior efficiency by conveying simulated five letter cipher group messages from Alaska, Idaho, Northern California, Oregon and Washington State to the National Response Coordination Center in Washington, D.C., scoring a 99.998 percent accuracy rate against 10,220 data points with message propagation times measured through the network in a superior range of 10 to 13 minutes. This successful test of CW traffic nets successfully ended any debate about the efficacy of CW for disaster communications.

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PE Introduction

The Power of the PE License

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DEMONSTRATES TECHNICAL COMPETENCE
OPENS UP CAREER OPPORTUNITIES

ESD
THE ENGINEERING SOCIETY OF DETROIT®
125 YEARS / 1895–2020

The professional engineer (PE) license is one of the most important credentials an engineer can obtain. A symbol that is recognized as an assurance of technical competence and a commitment to quality and ethics.

FREE INFORMATION SESSIONS ON EARNING YOUR PE LICENSE

The Engineering Society of Detroit is hosting complimentary sessions on earning your PE. Prepare for the next stage in your career and plan to attend. Engineering professionals will be on hand to answer your questions and provide you with the information you'll need to get started on your path to licensure.
The sessions will cover:

- Why you should consider becoming a PE
- State exam registration deadlines
- Requirements and process for completing the state applications
- Recommended study materials and steps for preparing for the exams
- ESD's Review Courses for FE and PE
- Real-life experiences of FE's and PE's who have taken the exams and passed

EARNING YOUR PE LICENSE INFORMATION SESSIONS

Online via Zoom

Mondays & Tuesdays, 6 – 7 p.m.
May 9 & 10 · May 16 & 17
May 23 (no session on May 24)
June 13 & 14 · June 20 & 21

Saturdays, 11 a.m. – noon
May 14, May 21, June 18, and June 25

COST:
Free to the engineering community.

REGISTRATION REQUIRED:
Visit esd.org to register or for more information or contact Elana Shelef at eshelef@esd.org.

FE Review Courses begin on July 19, 2022
PE Review Courses begin on July 23, 2022

ALREADY A PE? Please pass it on.

Download your Reference Manuals for FREE from the National Council of Examiners for Engineers and Surveyors at NCEES.org, who is the Registrar for both the Fundamentals of Engineering (FE) exam and the Principles and Practice of Engineering (PE) exam. You must create a free NCEES.org account to access these through the MyNCEES dashboard.

Exam Specifications for each discipline are also available for download and review.

To learn more about PE licensure, PE preparation tracks, or ESD courses, hop onto an information session at any of the specified dates and times here: https://www.esd.org/programs/pe-info/.

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James Webb Space Telescope

The James Webb Space Telescope (JWST) is the most powerful telescope ever launched into space, and a worthy successor to the famous Hubble Space Telescope (HST). Many of you may recall that is was recently launched on Christmas Day in 2021, amidst a great deal of excitement and high expectations (in the scientific community). But what is of equal interest to our IEEE readers is the history, technology and engineering that went into it. In this brief summary I will highlight many of these. By the way I have invited one of the scientists who has a current experiment on the JWST to give a talk in the Fall of 2022 so do lookout for it!

History
Discussions of a Hubble follow-on started in the 1980s, but serious planning began in the early 1990s. The initial flaws of the HST did influence the design of the JWST, something not many people are aware of. Initially it was called the Next Generation Space Telescope project. Then in 2002 it was renamed the James Webb, after one of the NASA administrators James E. Webb (who passed away in 1992). He led the Mercury, Gemini and Apollo programs, as well as established a lot of scientific research as a core NASA activity. In 2003, NASA awarded TRW the contract ($800 million), later Northrop Grumman acquired TRW so it became a Northrop Grumman Space Technology project.

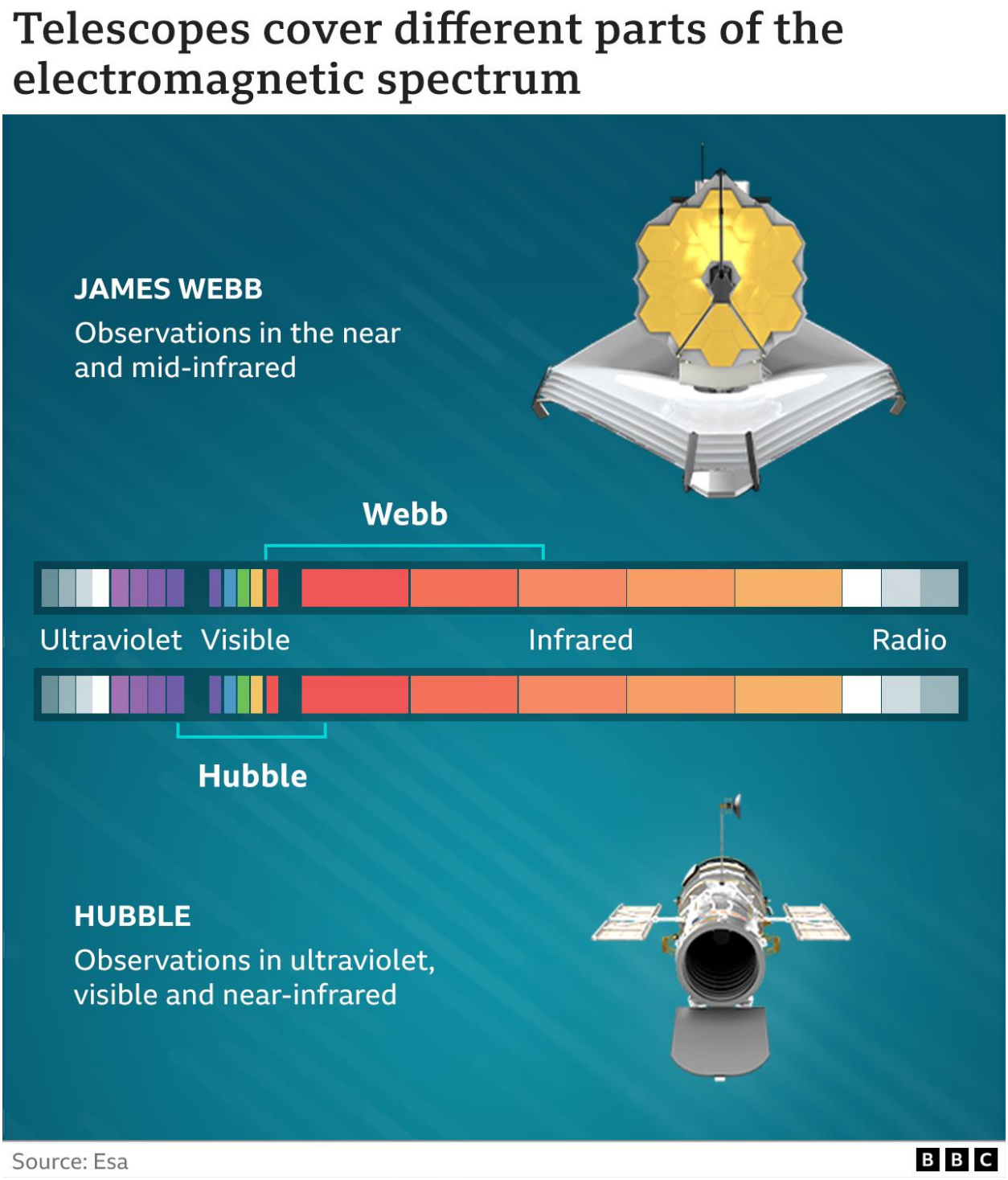
While on this topic, NASA is not the sole project owner, with funding and participation coming from the European Space Agency (ESA) and the Canadian Space Agency (CSA) who formally joined in 2004 and 2007 respectively. To overcome the visible optical limitations of the HST, it was decided to observe the infra red regions, since early galaxies had cooled off and any radiation they emit is in that region of the EM spectrum.

The design and development and testing – while massively complicated were not the major reasons of the cost over runs. The original estimate was $1.6 billion (total including operations). But it finally ended up at a little over $10 billion.

Mission
The James Webb Space Telescope has four key goals:

- to search for light from the first stars and galaxies that formed in the universe after the Big Bang
- to study galaxy formation and evolution
- to understand star formation and planet formation
- to study planetary systems and the origins of life

As mentioned earlier, it will work in the near infra-red spectrum or 0.6 to 28 μm.



Launch

The launch (designated Ariane flight VA256) took place as scheduled at 12:20 UTC on 25 December 2021 on an Ariane 5 rocket that lifted off from the Guiana Space Centre in French Guiana, all courtesy of the ESA. Since it is one of the most complex objects built, almost 300 things could go wrong at any time and render the entire mission useless, people have often described it as the “30 minutes of terror” launch!

The second most interesting thing is that it had to be far away from Earth in deep cold space, so that it’s sensitive instruments could function at *50 degree Kelvin (or -223 C or -370 F)* to observe faint signals in the infrared without interference from other sources of warmth. Even so, it has a fantastically designed heat shield to keep away the rays of the Sun from messing up the instruments. The other interesting aspect is it is located at the *Sun-Earth L2 Lagrange* point

in a halo orbit, where gravity keeps it delicately balanced between the two bodies (approximately 160,000 to 517,000 miles away).

The JWST carries 4 main instruments, which are managed by something called the Integrated Science Instrument Module (ISIM). That provides electrical power, computing resources, cooling capability and structural stability to the JWST. It is made with bonded graphite-epoxy composite attached to the underside of Webb's telescope structure. The instruments it manages are:

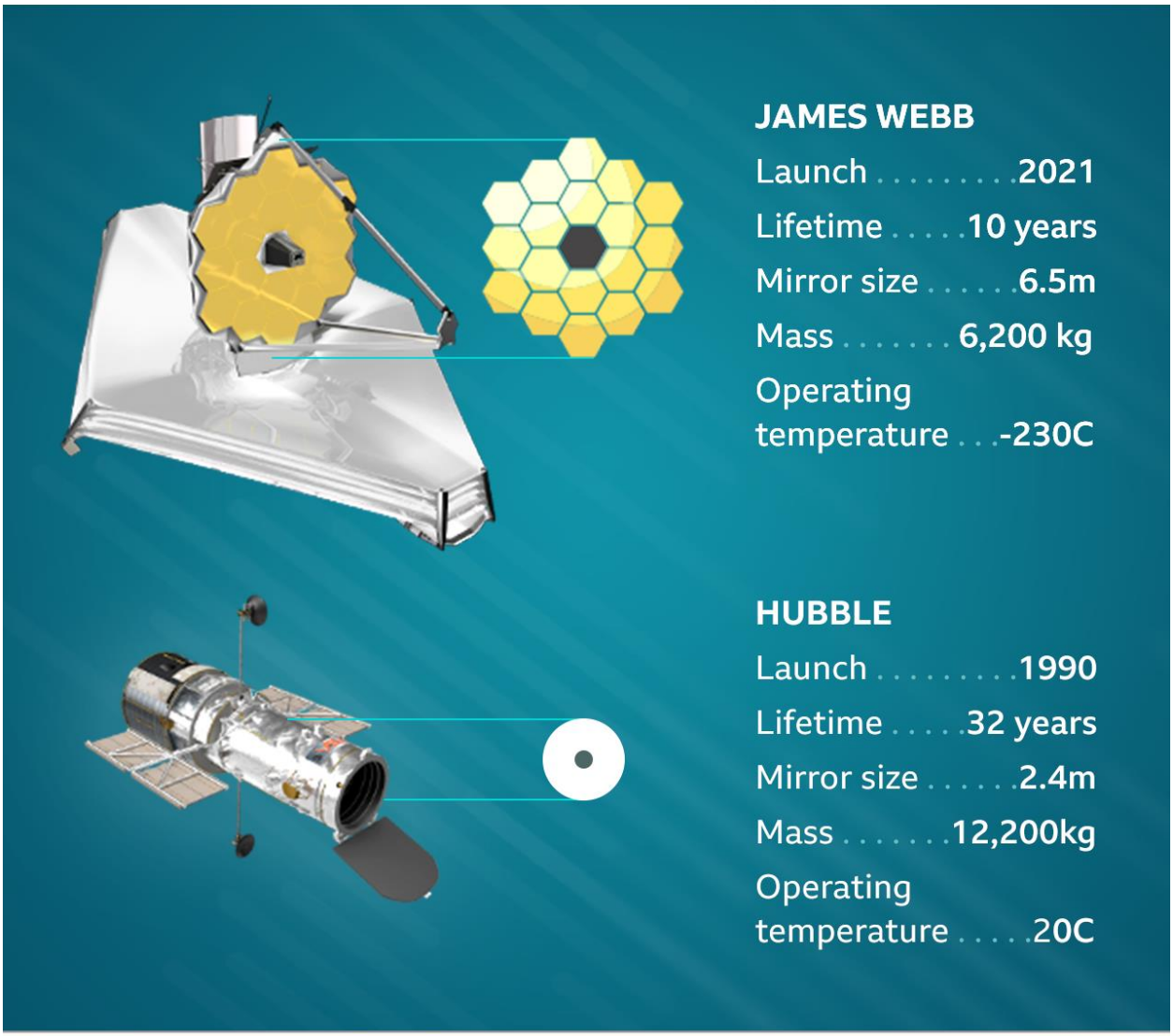
- NIRCam (Near InfraRed Camera) is an infrared imager with a spectral coverage ranging from the edge of the visible (0.6 μm) through to the near infrared (5 μm). All this using 10 sensors each of 4 megapixels. NIRCam was built by a team led by the University of Arizona and industrial partner is Lockheed-Martin's Advanced Technology Center.
- NIRSpec (Near InfraRed Spectrograph) was built by the European Space Agency at ESTEC in Noordwijk, Netherlands., as well as Airbus Defence and Space Germany, and the Goddard Space Flight Center. NIRSpec has two sensors each of 4 megapixels. The mechanisms and their optical elements were designed, integrated and tested by Carl Zeiss Optronics GmbH.
- MIRI (Mid-InfraRed Instrument) will measure the mid-to-long-infrared wavelength range from 5 to 27 μm. MIRI was developed as a collaboration between NASA and a consortium of European countries. The temperature of the MIRI must not exceed 6 K (−267 °C; −449 °F): a helium gas mechanical cooler sited on the warm side of the environmental shield provides this cooling.[43]
- FGS/NIRISS (Fine Guidance Sensor and Near Infrared Imager and Slitless Spectrograph), was contributed by Canadian Space Agency and is used to stabilize the line-of-sight of the observatory during science observations. NIRCam and MIRI feature starlight-blocking coronagraphs for observation of faint targets such as extrasolar planets and circumstellar disks very close to bright stars.

The infrared detectors for the NIRCam, NIRSpec, FGS, and NIRISS modules are being provided by Teledyne Imaging Sensors (formerly Rockwell Scientific Company). The JWST ISIM and Command and Data Handling (ICDH) engineering team uses SpaceWire to send data between the science instruments and the data-handling equipment. FYI – the transponders use the S-bad for telemetry, tracking and control (up speed is 16 kbits/s and down speed is 40 kbits/s) plus the Ka-band for data transmission upto 28 Mbits/s. A total of 2KW of power is needed to run everything.

The JWST Mirror

It is quite gigantic in size approximately 18 hexagonal mirrors segments made of gold-plated beryllium for a 21 foot diameter mirror. Compare this with Hubble at 7.9 feet. The other unique thing is the heat or sun shield which was folded in an origami fashion (12 times!) and unfolded at its final destination equivalent to the size of 2 tennis courts.

James Webb and Hubble compared



Source: Nasa BBC

As of June 2022, the telescope is undergoing instrument modes check out. Once operational, expected about the end of June 2022, JWST is intended to succeed the Hubble as NASA's flagship mission in astrophysics. NASA has scheduled the first official science images release event for Tuesday, 12 July 2022 at 10:30 am EDT.

Good places to check out current JWST news:

1. Official NASA website: https://jwst.nasa.gov/content/webbLaunch/index.html
2. JWST operations: https://webbtelescope.org/
3. L2 Lagrange points: https://www.esa.int/Enabling_Support/Operations/What_are_Lagrange_points

Sharan Kalwani

Member News

- Congratulations to Eric Dede for making Senior member!

Curated by

Sharan Kalwani,
Co-Editor, Wavelengths,
2017~2018~2019~2020~2021~2022
Email: Sharan.Kalwani@ieee.org

This Month in July

Or: Notable Events in History, which I Did Not Know! ☺

***Alan Dower Blumlein; Died 6 Jun 1942 at age 38**, (born 29 Jun 1903).*
British electronics engineer whose 128 patents contributed greatly in a wide field of electronics, including mono and stereo sound reproduction and sound recording, as well as high-definition radar, telephony and electrical measurements. His profuse creativity was achieved within just 18 years, because he died at age only 38 (while flight-testing a radar project during WW II). He began working in 1924 for International Western Electric Co., and by 1929 was with Columbia Gramophone Co. which became EMI (1931) where he invented the stereophonic recording system. Although a few stereo recordings were made in the 1930's, EMI did not extensively develop the technology until the 1950's, when it built on Blumlein's work.

Rube Goldberg; Born 4 Jul 1883; died 7 Dec 1970 at age 87.
American cartoonist who satirized the American preoccupation with technology. His name became synonymous with any simple process made outlandishly complicated because of his series of "Invention" cartoons which use a string of outlandish tools, people, plants and steps to accomplish everyday simple tasks in the most complicated way. Goldberg applied his training as a graduate engineer and used his engineering, story-telling, and drawing skills to make sure that the "Inventions" could work, even though dozens of arms, wheels, gears, handles, cups, and rods were put in motion by balls, canary cages, pails, boots, bathtubs, paddles, and even live animals for simple tasks like squeezing an orange for juice or closing a window in case it should start to rain.

Edwin J. Houston; Born 9 Jul 1847; died 1 Mar 1914 at age 66.
Edwin James Houston was an American electric al engineer who, together with Elihu Thomson (another Philadelphia high school teacher) experimented with electricity. Houston invented, patented in 1881 and manufactured arc street-lighting. He presented the first paper, Notes on Phenomena in Incandescent Lamps, to The American Institute of Electrical Engineers when it began in 1884 (AIEE - the predecessor society of the present IEEE, The Institute of Electrical and Electronics Engineers, Inc.). The merger of Thomson-Houston and Edison General Electric companies (1892) formed General Electric. In 1894 he joined with Arthur Kennelly (who resigned from Edison's laboratory) to form a consulting company

Seat-belt patent; July 1962
In 1962, a U.S. patent was issued to Swedish engineer, Nils Bohlen, for the three-point seat-belt (No. 3,043,625). His lap and shoulder design is now familiar as the passenger-restraint safety device in cars that has saved countless lives. His design replaced the earlier style of a single safety belts strapped across the body, with the buckle placed over the abdomen, which often caused severe internal injuries in high-speed crashes. Bohlin assigned the patent to Volvo, the car manufacturer for whom he worked. From Aug 1959, Volvo incorporated Bohlin's seat belt into the vehicles they manufactured. The company also made the design freely available to other car manufacturers to save more lives.

Nikola Tesla; Born 10 Jul 1856; died 7 Jan 1943 at age 86.
Serbian-American inventor and researcher who designed and built the first alternating current induction motor in 1883. He immigrated to the United States in 1884. Having discovered the benefits of a rotating magnetic field, the basis of most alternating-current machinery, he expanded its use in dynamos, transformers, and motors. Because alternating current could be transmitted over much greater distances than direct current, George Westinghouse bought patents from Tesla the system when he built the power station at Niagara Falls to provide electricity power the city of Buffalo, NY. [Born in Croatia of Serbian parents. Some sources give birthdate as 9 Jul; he is said to have been born on the stroke of midnight. He celebrated his birthday as the 10th.]

Theodore Maiman, Born 11 Jul 1927; died 5 May 2007 at age 79.
Theodore Harold Maiman was an American physicist who built the first working laser. He began working with electronic devices in his teens, while earning college money by repairing electrical appliances and radios. In the 1960s, he developed, demonstrated, and patented a laser using a pink ruby medium. The laser is a device that produces monochromatic coherent light (light in which the rays are all of the same wavelength and phase). The laser has since been applied in a very wide range of uses, including eye surgery, dentistry, range-finding, manufacturing, even measuring the distance between the Earth and the Moon.

R. Buckminster Fuller; Born 12 Jul 1895; died 1 Jul 1983 at age 87.

Richard Buckminster Fuller was an American inventor, educator, author, philosopher, engineer and architect who developed the geodesic dome. This large dome can be set directly on the ground as a complete structure. There is no limit to the size to which it may be built and retain sufficient structural strength. Fuller also invented a wide range of other paradigm-shifting machines and structural systems. He was especially interested in high-strength-low weight designs, with a maximum of utility for minimum of material. His designs and engineering philosophy are part of the foundation of contemporary high-tech design aesthetics. He held over 2000 patents.

U.S. Electrical units

In 1894, eight units for the measurement of electrical magnitudes were adopted in U.S. law when President Grover Cleveland signed an Act of Congress "to define and establish the units of electrical measure" for the ohm, ampere, volt, coulomb, farad, joule, watt and henry. It was specified to be "the duty of the Academy of Sciences to prescribe ... such specifications of details as shall be necessary for the practical application of the definitions." The Act followed an International Congress held at Chicago in 1893, in connection with the World's Fair. There, a Chamber of Delegates from various nations deliberated on the definitions. The International Congress was largely due to the Institute of Electrical Engineers and to local societies in the city of Chicago.

Jay W. Forrester; Born 14 Jul 1918.

Jay Wright Forrester is an American electrical engineer and management expert. In 1944-51 he supervised the building of the Whirlwind computer at the Massachusetts Institute of Technology, for which he invented the random-access magnetic core memory, the information-storage device employed in most digital computers. He also studied the application of computers to management problems, developing methods for computer simulation.

July 14th 2013, Last telegram in India

In 2013, the world's last telegram was sent in India. It was the last major country to shut down telegram service. India's 163-year-old telegram service was no longer needed, as e-mail and texting had replaced bicycle telegram messengers. In Great Britain, telegram delivery ceased in 2008, while the U.S., Western Union's dwindling service was terminated 27 Jan 2006. The first formal telegram was sent by Samuel Morse in Washington to his business partner Alfred Vail in Baltimore, on 24 May 1844. Seeking funding, he demonstrated to Congress the power of telegraphy through wires connecting cities with the message, "What hath God wrought." In time, wires were strung across the U.S. and other countries, which eventually were connected by a Transatlantic cable under the ocean and more submarine cables.

Dan Bricklin; Born 16 Jul 1951.

American computer scientist who with Bob Frankston created VisiCalc, the first spreadsheet computer program (1979) which created a market beyond hobbyists for the emerging personal computers. Businesses found the program very useful because of the speed and accuracy of its calculations. Originally written in 6502 assembly language to run on a 32K-byte Apple II, it was soon ported to virtually all major 6502- and Z80-based personal computers then available. They did not reap huge financial profits from the spreadsheet program, despite eventually selling over a half-million copies by 1983, because at the time, copyright protection was not generally sought for software, and it was subsequently surpassed by Lotus 1-2-3, later Microsoft Excel. It is anticipated that soon open source offerings such as LibreOffice may overtake Excel due to the extremely low (or zero cost) of entry.

Readers are invited to share any ***major engineering*** event or milestones that they are aware of that occurred in the next issue. Submissions can be made using direct email to the editors at: wavelengths@ieee-sem.org

Sharan Kalwani
Passionate Engineering History Buff/Aficionado

ORG UNITS cheat sheet

Section Unit Name or Affinity Group or Chapter Name (Organizational Unit code is in parentheses)		
Consultants Network Affinity Group:	(CN40035)	
Life Members:	(LM40035)	
Young Professionals:	(YP40035)	
Women in Engineering:	(WE40035)	
Chapter: 01	(CH04049)	(SP01) Signal Processing Society, (CAS04) Circuits and Systems Society and (IT12) Information Theory Society
Chapter: 02	(CH04051)	(VT06) Vehicular Technology Society
Chapter: 03	(CH04053)	(AES10) Aerospace and Electronic Systems Society and (COM19) Communications Society
Chapter: 04	(CH04050)	(AP03) Antennas and Propagation Society, (ED15) Electron Devices Society, (MTT17) Microwave Theory and Techniques Society,
Chapter: 05	(CH04055)	(C16) Computer Society
Chapter: 06	(CH04056)	(GRS29) Geosciences and Remote Sensing Society
Chapter: 07	(CH04057)	(PE31) Power Engineering Society, (IA34) Industrial Applications Society
Chapter: 08	(CH04088)	(EMC27) Electromagnetic Compatibility Society
Chapter: 09	(CH04087)	(IE13) Industrial Electronics Society, (PEL35) Power Electronics Society
Chapter: 10	(CH04142)	(TEM14) Technology and Engineering Management Society
Chapter: 11	(CH04099)	(EMB18) Engineering in Medicine & Biology
Chapter: 12	(CH04103)	(CS23) Control Systems Society
Chapter: 13	(CH04113)	(E25) Education Society
Chapter: 14	(CH04115)	(RA24) Robotics And Automation Society
Chapter: 15	(CH04144)	(NPS05) Nuclear Plasma Sciences Society
Chapter: 16	(CH04125)	(CIS11) Computational Intelligence Society, (SMC28) Systems, Man and Cybernetics Society
Chapter: 17	(CH04128)	(NANO42) Nanotechnology Council

Section Unit Name or Affinity Group or Chapter Name (Organizational Unit code 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)

Use the Geo-unit ‘Code’ for faster access in the vTools system applications.

HKN Code	HKN Name (Student IEEE Honor Society)
HKN029	University of Michigan-Ann Arbor, Beta Epsilon
HKN042	University of Detroit-Mercy, Beta Sigma
HKN054	Michigan State University, Gamma Zeta
HKN073	Wayne State University, Delta Alpha
HKN163	University of Michigan-Dearborn, Theta Tau
HKN164	Lawrence Institute of Technology, Theta Upsilon
HKN190	Oakland University, Iota Chi
HKN244	Southeastern Michigan Alumni

Organization Unit IEEE Code	Student Technical Chapter name
SBC00531	University of Detroit-Mercy, Computer Society Chapter
SBC02251	Wayne State University, Computer Society Chapter
SBC03921	Lawrence Tech University, Computer Society Chapter
SBC06741	Oakland University, Engineering in Medicine & Biology

Why do we publish this? Well, this is most useful when searching the vTools page for entering L31s or creating new events or searching for existing events!

Curated & Maintained By
Sharan Kalwani,
Chair, IEEE SE Michigan Education Society Chapter
Vice-Chair, IEEE SE Michigan Computer Society Chapter
Editor, Wavelengths,
2018~2019~2020~2021~2022

Use the Geo-unit ‘Code’ for faster access in the vTools system applications.

RoboFest Update

(1) 2022 Robofest Online World Championship Winners and Presentations Posted

Thank you all once again for an incredible Robofest season!! We are so thankful that we can reach so many students from so many parts of the world through our Autonomous Robotics Competition!

We have uploaded all of the event score sheets to each event page (go to Registration) so you can see the final results. We have also uploaded the event highlight videos, award slides, the complete winners list, and a link to all the group photos that were taken to the World Championship page on the Robofest.net website.

We hope to see you all next season!

(2) MCWT Foundation Grant Recipients Announced

Congratulations to the teams who received the 2022 Robofest Grant from our Gold Sponsor, Michigan Council of Women in Technology Foundation. These all-female teams from Michigan received a $500 grant to participate in Robofest and the funds may be used for registration, equipment and materials.

Champions from Gallimore Elementary in Canton, MI, coached by Bharat Nagireddy
Ecotek1 from Ecotek in Detroit, MI, coached by Leia Keen
UPSM Octobot from University Prep Science & Math High School in Detroit, MI coached by Pam Sparks

Thank you to MCWT for your sponsorship and continued support of female Robofest teams!

(3) 2023 Season Kickoff Dates Announced

The Robofest 2023 Season International Game Rules will be released on Saturday, October 1, 2022. We will host a series of kickoff meetings to review the rules for clarification prior to the US release in November. All rules will be finalized in January 2023.

The kickoff meetings will be held:

Friday, October 21, 2022 10:00 am (Zoom only)
Friday, November 3, 2022 7:00 pm (In the Robofest Lab and Zoom)
Saturday, January 7, 2023 11:00 am (In the Robofest Lab and Zoom)

(4) Free Robofest eAcademy Online Classes

Robofest eAcademy is a series of online classes developed by Robofest instructors. Courses are available for free to Robofest teams through the Schoology Learning Management system. Courses have individual lessons, code samples, videos and tests for knowledge. More details can be found on the Robofest.net website under "Tech Resources eAcademy" https://robofest.net/index.php/eacademy/courses

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Lawrence Technological University / Robofest / J-233 / 21000 W. Ten Mile Rd, Southfield, MI 48075
Dr. Christopher Cartwright, Director, ccartwrig@ltu.edu
Elmer Santos, Assistant Director, esantos@ltu.edu
Shannan Palonis, Coordinator, spalonis@ltu.edu
Pam Sparks, Coordinator, psparks@ltu.edu
Dr. CJ Chung, Advisory Board Chairperson (Volunteer), cchung@ltu.edu

http://www.robofest.net http://facebook.com/robofest

Activities & 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 located at http://r4.ieee.org/sem/**

SEM Wavelengths:
https://r4.ieee.org/sem/about-sem/sem-history/wavelengths-magazine-archive/

SEM Calendar of events:
https://r4.ieee.org/sem/sem-calendar/
Select "SEM Calendar" button in the top row of the website. 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 Collabratec Workspace:
https://ieee-collabratec.ieee.org/app/workspaces/5979/IEEE-Southeastern-Michigan-Section/activities
An IEEE supported space for online chat, discussions, connecting with other global IEEE entities, besides our local Michigan folks.

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

Other Happenings

Here are some of the non-IEEE functions 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. NOTE: Copy the URL and paste it into your browser address bar.
These websites were checked in June 2022 and found viable.
Send details to: wavelengths@ieee-sem.org OR letters@ieee-sem.org

Michigan Institute for Plasma Science and Engineering: Seminars for the 2021-2022 academic year:
https://mipse.umich.edu/seminars_2122.php

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

Model Rocketry
https://www.nar.org/find-a-local-club/nar-club-locator/

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
https://www.robofest.net/index.php/about/contact-us

Science Fiction Conventions
https://2021.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/

It appears that the SouthWest Michigan Maker Faire was a casualty of the Global Pandemic, as were many of our friends and several organizations.

However, we retain this link for anyone wishing to make contact and consider pumping life back into what was a wonderful experience.

Executive Committee

The SEM Executive Committee is the primary coordination unit for Southeastern Michigan (SEM) IEEE operations. The basic organization chart below shows the 2019/2020/2021/2022 arrangement of communications links designed to provide inter-unit coordination and collaboration.

The SEM Executive Committee meets in a teleconference each month on usually on a Thursday at 6:30 pm. 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 secretary@ieee-sem.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.

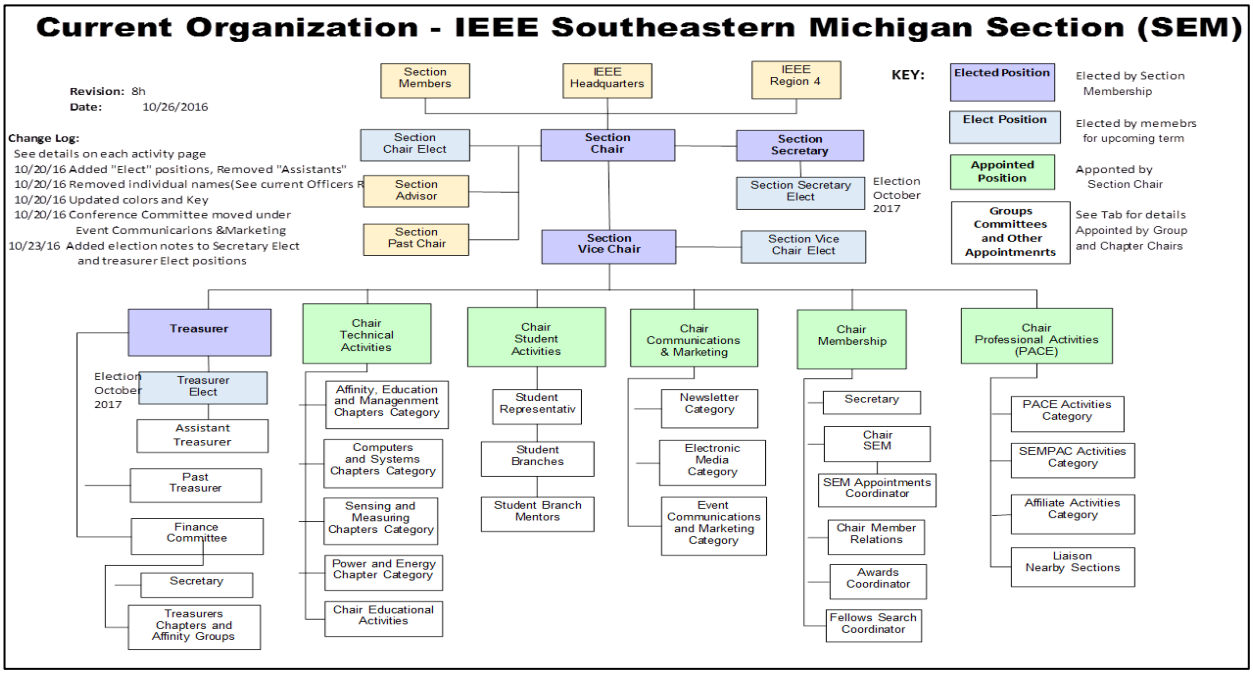
However, members of the section may have multiple technical interests and would like to have meeting information of other chapters. In order to communicate the meeting dates of all the chapters, affinity groups etc., to our members to facilitate their attendance, leaders of the groups are requested to 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 (Secretary)
Email: secretary@ieee-sem.org

If you wish to download the complete SEM Organization Chart, in PDF format, it will be made available soon at http://r4.ieee.org/sem/ . In the meantime, you may use the diagram below (soon to be refreshed!)



ExCom Meeting Schedule

NOTE: All SEM members are invited to attend ALL ExCom (Executive Committee) meetings:

Below is the 2022 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. Please mark your calendars for the 2022 meetings. Or, link your personal calendar to the SEM Web calendar.

Section Administrative Committee (ExCom) Meeting Schedule for 2022:

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**.

ExCom Meeting	*Date & Time*
July 07,2022 - SEM Section ExCom Monthly Meeting (Teleconference) for July 2022 https://events.vtools.ieee.org/m/289871	**6:30 PM**
August 04,2022 - SEM Section ExCom Monthly Meeting (Teleconference) for August 2022 https://events.vtools.ieee.org/m/289872	6:30 PM
Sept 01,2022 - SEM Section ExCom Monthly Meeting (Teleconference) for September 2022 https://events.vtools.ieee.org/m/289873	6:30 PM
October 06,2022 - SEM Section ExCom Monthly Meeting (Teleconference) for October 2022 https://events.vtools.ieee.org/m/289875	6:30 PM
Nov 03,2022 - SEM Section ExCom Monthly Meeting (Teleconference) for November 2022 https://events.vtools.ieee.org/m/289876	6:30 PM
Dec 01,2022 - SEM Section ExCom Monthly Meeting (Teleconference) for December 2022 https://events.vtools.ieee.org/m/289877	6:30 PM

Christopher Johnson (Secretary)
Email: secretary@ieee-sem.org

Editorial 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
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lunnmalcolm@me.com
akio@emcsociety.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.

We always encourage all chapters and student branches to share news of activities (both past and future) in their arenas. Please feel free to share any and all information so your peers, colleagues can hear about all the good work you do.

Quote:
"If a tree falls in a forest and no one hears it, how do you know it actually fell??"

So, publicize your work, one never knows when it can pay off!

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.

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

Sharan Kalwani,
Chair, IEEE SE Michigan Education Society Chapter
Vice-Chair, IEEE SE Michigan Computer Society Chapter
Co-Editor, Wavelengths,
2018~2019~2020~2021~2022

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*	*New Year Officers*	*Officer's Welcome*	*The Year Ahead*	
Feb	*Cons*	*2*		*MSU*	*Science Fair Judges*	*National Engrs Wk.*	*Surviving Winter*	
Mar		*3*	*13*	*EMU*	*Elections - Prep*			
Apr		*4*		*U/M-D*		*ESD Gold Awards*	*Chapter Focus*	
May	*Life*	*5*	*14*			*Science Fair*		
Jun		*6*					*Leadership Skills*	
Jul		*7*	*15*				*Students Issues*	
Aug	*WIE*	*8*			*Nominations Call*		*Womens Issues*	
Sep		*9*	*16*	*LTU*	*Ballots*	*Engineers Day?*	*Professional Skills*	
Oct		*10*		*U/M-AA*	*Elections!*	*IEEE Day*		
Nov	*YP*	*11*	*17*	*WSU*	*Election Results*	*New Fellows*		
Dec		*12*		*U/D-M*	*IEEE-Com Apmts.*		*Happy Holidays*	*R4 Nom*

Wavelengths Annual Publication Plan for Personal Profiles

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

IEEE Southeastern Michigan
Electrical and Electronic Engineers Creating Our Future

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)
https://www.facebook.com/groups/ieeesemich

SEM LinkedIn Page
(Select the "in" button under the top row)
https://www.linkedin.com/groups/1766687/

SEM Twitter Account (new)
(Select the "t" button under the top row)
https://www.twitter.com/ieeesemich

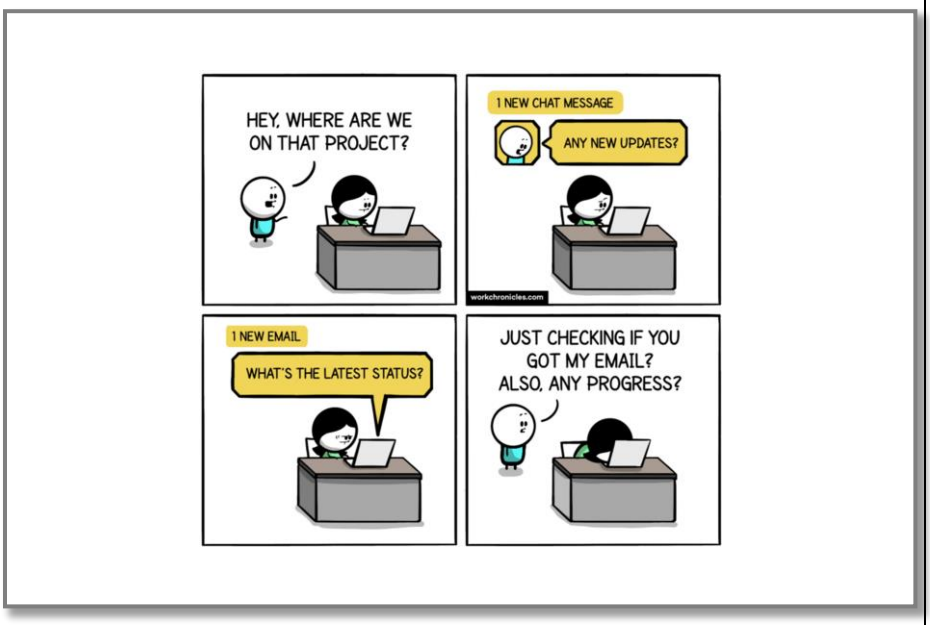
SEM Collabratec Workspace (new)
https://ieee-collabratec.ieee.org/app/workspaces/5979/IEEE-Southeastern-Michigan-Section/activities

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 "Organization Roster"

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 Thursday of Each Month @ 6:30 PM
- 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 Meetings:

- Find the location, and Registration at:
  http://bit.ly/sem-ieee

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:
  http://bit.ly/sem-upcoming