A Look Back on 2017

A number of changes have been afoot at SEMI and FlexTech over the course of 2017. First of all, SEMI announced the appointment of Ajit Manocha as its president and CEO earlier this year. Ajit comes to SEMI with a rich level of experience and understanding of the semiconductor industry.

Ajit restructured the organization after his first 100 days at the helm to more effectively address key initiatives of strategic importance under the mantra of Connect, Collaborate and Innovate. One of those initiatives is a concerted effort to influence positively technology and innovation in the semiconductor industry. We welcomed the addition of the MEMS and Sensors Industry Group (MSIG), which, along with FlexTech, joins a growing set of SEMI strategic partners with an eye on new directions for electronics solutions for the marketplace in the near-term and into the future.

A quick review of 2017 reveals activity and progress on several fronts. R&D in the flexible hybrid electronics (FHE) ecosystem continued with a combination of 13 FlexTech projects and 13 NBMC projects—in partnership with ARL and AFRL, respectively. Sixty-six project reviews, 11 governing council meetings, 5 technical council meetings, and 2 project calls later.

Global FHE expansion of the community continued with 5 FLEX conference and communication events in the United States, Europe, Japan, Korea, and Southeast Asia. In addition, a kick-off event and committee formation took place in Suzhou, China, in preparation for FLEX China in 2018.

We reviewed the progress of our five functional initiatives for 2017 during last week’s FlexTech Governing Council meeting. Those strategies include:

- establish the FHE technology information hub
- continuously revitalize our membership
- bring the FHE community together for information sharing at the FLEX events
- fund R&D strategically, helping to shape the FHE technology landscape
- continue to develop and chart the global FHE supply chain for a healthy and profitable FHE community

We were happy to report progress in all 5 categories, and expect great strides in 2018.

From all of us at FlexTech, we hope you have a safe and joyful holiday season. Thank you for all your hard work and contribution in driving flexible hybrid electronics forward and we look forward to working with you in 2018.

With our best wishes,

Melissa Grupen-Shemansky
CTO
PROJECT CLOSE OUT - 15-173 Flexible, Self-powered, motion, sound and time varying electromagnetic field sensing array sheet with remote readout - Princeton University

FlexTech Members Only Content
The Cal Poly project team held their kick off meeting for their Printed Electronics—A Benchmark Study on October 13, 2017. This 9-month long project will identify current companies and research groups, processing technologies and performance target for printed and FHE functional components or blocks for 3, 5, and 10 year horizons.
The plan starts with an extensive literature search and conference attendance. The team will then conduct phone interviews of targeted leaders in printed and FHE electronics offering a free benchmark executive summary for roadmap information not discovered in the public domain search. The study will conclude with a TRL/MRL assessment for each printed electronics technical category. FlexTech will provide the investigators a comprehensive contact list for the consortia members for both FlexTech and NextFlex.

If you are interested in contributing to this benchmark study, please reach out to John Pan at pan@calpoly.edu or (805) 756-2540 at Cal Poly for more information.

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**PROJECT KICK OFF - NF1-17-03 Ultra-thin, flexible integrated power pack for functional electronic print (FEP) devices - ITN Energy**

ITN Energy, in collaboration with ENrG and Lucintech, entered into a new development project agreement with FlexTech to develop and produce a flexible, integrated power pack (FIPP). The FIPP will combine thin-film PV and solid-state batteries in a single, vertically-integrated package with a goal of less than 250 microns in thickness. The FIPP will also provide high efficiency (14%), novel packaging and contain a high energy density, safe, rechargeable solid state batteries (SSLB).

The current development strategy is to improve the energy density of the state-of-the-art flexible batteries through innovative advanced packaging and integration of cells and photovoltaic transducers.

In the small form factor necessary for the FEP application, capacity of over 200 mAh may be impractical. But self-contained recharge-ability will compensate for the intrinsic capacity limitations. Initial simulations, assuming 12 to 14% efficiency for the PV, estimate about an hour recharge time to bring the battery to full capacity in 1 sun (AM1.5). This project is scheduled to conclude in Q3 2018.

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**PROJECT KICK OFF - SEMI-FlexTech Selects PARC to Build Ultra-Thin, Flexible Audio Speaker**
**FlexTech**, a SEMI Strategic Association Partner announced a new development project with **PARC**, a Xerox company, to develop a hybrid, highly bendable, paper-like smart tag, incorporating a thin audio speaker. The product is aimed at applications in packaging, wearables prosthetics, soft robotics, smart tags, and smart cities and homes.

PARC will use ink jet printing to build prototypes of the paper-like smart tags capable of producing audio signals, on a silver-printed polyethylene naphthalene (PEN) or polyimide (PI) substrate. They will develop and demonstrate a process for bonding chips, and printing active and passive components, as well as interconnects on the flexible substrate, essential in meeting the project goals for ruggedness and form factor. PARC will also focus on printing actuators to create thin film audio speakers. The technology will enable custom systems to be built on demand.

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**News and Announcements**

**2017FLEX Southeast Asia**

The 2\textsuperscript{nd} Annual FLEX SEA was held on October 25-26, 2017 at the Suntec Singapore Convention & Exhibition Center. Held in conjunction with ASTC, this year’s theme was “The Convergent Future: Industries-wide Disruption through Flexible Hybrid Electronics.”

Over the span of 2 days, 80+ attendees listen to 17 presentations address how FHE is disrupting the electronics industry and adding a new component to the semiconductor mix by producing evolved integrated products rather than a replacement or competitor. Key takeaway from Jennifer Colegrove’s presentation included the hot technology trends emerging next year, including AI quantum dot, flex display, gesture, voice and proximity control. Raghu Das from IDTechEx, emphasized that 60% of the leading market drivers for FHE lies in the flexible and conformal form factor. Chee Kien Lim from STATS ChicPAC drove home the point by stating that system-in-packaging (SiP) technology is emerging as a formidable contender to the paradigm shifts in the microelectronics industries, lending a hand to thin flex substrate, thin die, IPD and wafer leveling packaging in various applications.

**2017 International Emerging Display and Smart IoT Conference**
The 2017 International Emerging Display and Smart IoT Conference was held in Jinshan, China on October 12, 2017. With over 250 attendees, the one-day forum focused on emerging display technologies and applications, smart automotive and IoT.

Organized by SEMI China, the Shanghai Jinshan District Government and the Shanghai Municipal Commission of Economy and Information Technology, the forum aimed to build an interest and support from global industry stakeholders to help launch the Jinshan Industry Funds and Shanghai Emerging Display Technology Innovation Center.

FlexTech member’s, SmartKem and FlexEnable, made presentations at the forum to address their outlook on the display industry. Steve Marsh, Chief Business Officer at SmartKem talked about the prevalence of organic thin-film transistor in the near future. Dr. Patrick Too, Principal Scientist at FlexEnable continued the discussion with his presentation on low cost, conformable OLEDs on plastic.

The 7th Chinese Flexible and Printed Electronics Symposium (FPE China) & SEMI China FlexTech Committee Kickoff

FPE China 2017 was held on October 25-27, 2017 in Suzhou, China at the Suzhou International Expo Center. With 39 presentations, 50 poster presentations, 11 exhibit booths and 200 attendees at the 3 days symposium, prominent speakers include Professor Donal Bradley from Oxford University, Dr. Dongfang Yang from BOE, Dr. Janglin Chen from the Industrial Technology Research Institute (ITRI) in Taiwan and more.

As an invited speaker, Melissa Grupen-Shemansky, CTO at FlexTech introduced SEMI-FlexTech’s work and contribution to flexible, hybrid and printed electronics. With the expansion of the FLEX conferences worldwide, FPE China will serve as a platform for FLEX China to build on.

The SEMI China FlexTech Committee kick off meeting commenced after FPE China on October 27, 2017. The committee is comprised of a mix of industry, academia as well as SEMI China staff to help bridge the gap for China’s flexible, hybrid and printed electronics industry and provide direction for SEMI China’s FLEX conferences. Leading the committee as the Chairman is Professor Zheng Cui from the Suzhou Institute of Nanoscience and Nanotechnology, Chinese Academy of Sciences and the Co-chair is Jie Zhang from Changzhou Institute of Printed Electronics Industry.

For more information about the Flexible and Printed Electronic Symposium, Suzhou Institute of Nano-Tech and Non-Bionics (SINANO) has a great summary article with photos.
2018 FLEXI Awards — Sponsored by SCREEN Holdings Inc.

Nominations for 2018 FLEXI Award will open in December 2017!


2018FLEX’s Agenda Released — More than 100 Speakers, 22 Sessions and 4 Short Courses

From Materials to Market, 2018FLEX’s agenda will address the imminent concerns of the flexible hybrid electronics industry's entire supply network. This year, we have an impressive array of speakers in the program and 4 short courses available on Monday to dive deep into the technical spectrum of FHE.

Check out the agenda, reserve your hotel room and register now to take advantage of our early bird pricing!

Printed Electronics Insights: Smart Packaging & IoT Summary

OE-A's recent industry workshop – Printed Electronics Insights: Smart Packaging & IoT - was hosted at Cambridge University on October 11-12, 2017. Co-sponsored by SEMI-FlexTech and the EPSRC Centre for Innovative Manufacturing in Large Area Electronics, this initial event drew 100+ participants for two days of roadmapping, technical discussions, and networking.

Upcoming Events

2018FLEX
Monterey, California, USA
Download the 2018 UPCOMING Events Calendar!

SEMI 673 S. Milpitas Blvd Milpitas California 95035 United States