



IEEE Tokyo Section Life Members Affinity Group

In this issue, a greeting from Prof. Tadashi Takano (LMAG Chair), LMAG-Tokyo general assembly, the associated lecture, the third evening salon, and the future events are reported.

1. Address of Prof. T. Takano, Chair, In the 2019 Annual General Assembly of IEEE LMAG-Tokyo

Dear friends of IEEE LMAG-Tokyo. The year of 2019 has already started and we would enjoy it with you.

As you know, Life Member is a title given to a member who is older than 65 years and the sum of the age and membership period is over 100. The objectives of LMAG are to enhance the friendship between LMs, to raise intelligence through communications with younger people, and to contribute to society using rich experience.

Last year, we held the IEEE Milestone-related tour to Nobeyama Radio Observatory of National Observatory, and 2 technical tours to research institutions, 6 lecture meetings in co-sponsorship with IEEE Tokyo Section. Moreover, an evening salon was held as an event based on a local community. Those events are reported in Newsletters in the LMAG-Tokyo home page.

This year, we are planning to hold many technical tours and lecture meetings in the same way as last year. Many participants of LMAG members and others are welcome.

Turning our eyes to the whole Japan, other LMAGs were founded in Nagoya last year and Sendai this year, respectively, following

LMAG-Kansai. LMAG-Tokyo, as the head LMAG, should cooperate with other LMAGs. With other Affinity Groups, we will make efforts for collaboration and support.

Looking at the world, we will positively collaborate with foreign LMAGs and participate in their activities. Especially, R10 LMAG Committee was established last year, and I am requested as a Committee member to pay attention to LMAGs in the R10.

I have succeeded the management of LMAG-Tokyo from Prof. Miki, former Chair, so that Hajime Imai, Vice Chair, Naohisa Ohta, Secretary, and myself will make our bests to pursue it. We would ask your kind support to our activities same as the last year.

2. LMAG-Tokyo Annual General Assembly

The 2019 LMAG-Tokyo General Assembly was held at Room 66, Kikai-Shinko-Kaikan, from 14:00 to 14:30, March 29, Thursday, 2019. The assembly was presided by Dr. Ohta, Secretary. At the beginning, it was reported that the participants were 27 and other 595 LMAG-Tokyo members entrusted the executive. After the new officers were introduced, Prof. Takano, Chair, gave a greeting and continued to discuss the following agenda, and all of them were approved.

Agenda 1: Report on 2019 LMAG Officer Election

Prof. Imai, Vice Chair, reported the process and results of 2019 LMAG officers election. After the announcement of the recommended candidates on October 5, 2018, no additional candidates were proposed by members. Then, the candidates were elected as new officers.

Agenda 2: Report on 2018 LMAG-Tokyo Activities

Prof. Imai, Vice Chair, reported the following events pursued in 2018.

- 2018 LMAG-Tokyo general assembly (March 29).
- Lecture meetings.

A lecture associated with the general assembly (March 29) and four lectures, both



Fig. 1 Scene of 2019 Annual LMAG-Tokyo General Assembly
(from left, Imai, Vice Chair, Takano, Chair, Ohta, Secretary)

co-sponsored with Tokyo Section, and a lecture sponsored by only LMAG. The participants total were about 230.

- Technical Tours.

Nobe-yama 45-meter Radio Telescope (IEEE Milestone recipient), Electronic Navigation Research Institute (ENRI), Japan Auto-mobile Research Institute (JARI). The participants were 18, 29 and 26, respectively.

- LMAG Evening Salon.

The second evening salon was held at Kikai-Shinko Kaikan Bldg with 20 participants (May 15, 2018).

- Support to LMAG activities in other sections.

An LMAG-Tokyo officer participated in a technical tour sponsored by LMAG-Nagoya (March 30, 2018).

- Activities associated with IEEE Region 10.

Prof. Takano participated and gave a talk in SYWL Congress (from Aug. 30 to Sept. 2, 2018).

- Publication of LMAG-Tokyo Newsletter (3 issues).

Agenda 3: Activity Plan for 2019

Dr. Ohta, LMAG-Tokyo Secretary, explained an activity plan for 2019.

- 2019 LMAG-Tokyo general assembly (March 27).

- Lecture Meetings and Technical Tours.

Lectures (sponsored or co-sponsored) are planned more than 4 times. Technical tours to industrial sites and to an IEEE Milestones recipient site, and an evening salon are planned.

- Participation in the events held by other Affinity Groups.

- LMAG-Tokyo Newsletter publication.

Newsletter is to be published 3 times and sent out via email. Newsletter delivery via postal mails is considered if necessary.

Finally, in a Q&A session, a variety of opinions were exchanged for further activation of LMAG-Tokyo. The topics discussed included a possibility to collaborate with an IEICE' s group with a similar scope to LMAG, consideration on revising LMAG-Tokyo Bylaw in line with actual situation, and how to activate collaborations with other Affinity Groups such as Young Professionals AG.

2. Lecture in the 2019 Annual General Assembly of Tokyo Section

After the General Assembly of Tokyo Section, the lecture by Dr. Jun-ichi Nakamura was held in the Kikaishinko-Kaikan building at 14:30 with 27 participants. Dr. Nakamura is CTO of Brillnics Japan Inc. His career started from entering Olympus Optical Co., Ltd (presently Olympus Corporation) and was engaged in R&D of solid-state sensor devices including the function of amplifier. Then he moved to NASA JPL as a

guest researcher. He founded the Japan branch of Photobit, then moved to Micron and Aptina. He is now on the present position.

The lecture was entitled “ Development of CMOS image sensor and its key technologies. He first talked about R&D of CMOS image sensors from the start to the present. Specially, he introduced his work on the image sensors for super high definition TV and the wide dynamic range image sensor focusing on the image cell and the CMOS circuit.

Comparing a CMOS image sensor with a CCD image sensor, the light detection structure is the same of the photodiode, but the connecting amplifier circuit is different: CMOS circuit or CCD circuit. The CMOS circuit is superior in high-speed response and matching with the following circuit. The CCD circuit is inferior in the wafer process yield degradation due to requiring perfect wafer process.

The CMOS circuit is poor in dynamic range. He improved this weak point to change the amplification factor according to the input signal level. In order to realize a high definition image, he reduced the capacitor size of each cell. To maintain the total quantity of stored charges, the drive voltage was made larger.

Moreover, he introduced the incident light from the back side of wafer to obtain more sensitivity by preventing the surface reflection of interconnect and electrodes. And he also introduced the detector with multiple layers to discriminate the detection of 3 primary colors.

Other trials were introduced such as infrared image sensors and 3-dimension image sensors. Due to the restriction of lecture time, question and comment were omitted. The lecture ended with big applause.



Fig.2 Scene of the talk by Dr. Nakamura

4. Report of Evening Salon

The third evening salon of LMAG-Tokyo was held at 16:00 to 19:00 on May 9th, Thursday at the large meeting room of Fujikura Ltd., gathering 29 participants. The salon aims to offer a place where all participants exchange

their opinions on provided topics freely while eating and drinking.

At first, the participants were introduced to a short tour to the exhibition room where the history of Fujikura from 1885 to the present was displayed.

In the first session, Dr. Kazuhiko Aikawa introduced the optical fiber market evolution. The volume of optical fibers has been increased according to the information increase due to the demand of internet. Presently the produced volume is 6-billion km, and the base material is sufficient to be supplied till 2023. Optical fiber cables are assorted to various kinds, for example, tape fibers, 3458 fiber cables, and 6912 fiber cables. Recently, a fiber embedded with multi-cores has been investigated. The minimum loss of an optical fiber was reported to be 1.424 dB/km at 1.560 μm wavelength, which was the best data.

In the second session, Dr. Yasuhiro Iijima introduced the development of high temperature superconductors. At first, he explained the history of the critical temperature of superconducting materials. In 1980, R&D of high temperature superconducting materials was one of the hot topics.

It was made clear that the high temperature superconductor was not applicable to the power line with high conducting current, but applicable to the medical instrument such as NMR. In this case, the high critical magnetic field is significantly effective.

Usually the superconductor needs liquid Helium for the operation. Currently, the supply of He is reduced so that the price is increasing gradually. Superconductors of Nb related materials are being put into practical use, but high temperature superconductors are still under investigation.

After the introductions, we enjoyed the time of questions and comments while eating and drinking.



Fig.3 Scene of the 3rd evening salon. Mr. Tanaka of Fujikura presides the session.



Fig.4 Group photo of the evening salon participants
Dr. Aikawa (center in the front row)
Dr. Iijima (right of Dr. Aikawa)

The topics were the application of the multi-core fiber, the conjunction with Si photonics, superconductor filters etc. Discussions continued till the salon was obliged to end due to the time limit.

5. LMAG-Tokyo Future Events

The following events are scheduled.

Technical Tour to DoCoMo R&D Center

- Date & Time: June 10, 2019 (Mon)
14:00 ~ 17:00
- Venue: DoCoMo R&D Center (Yokosuka Research Park).
- Lecturer Mr. Seizo Onoe, President, DOCOMO Technology, Inc.
- Lecture title: "5G (5th Generation Mobile Network System) - Its Technical Features and Social Impacts"

For further information, contact IEEE Tokyo Section tokyosec@ieee-jp.org.

Technical Tour associated with IEEE Milestone Recipient

- Site: Fujisan Rader Dome
(1936-1, Shinya, Fuji Yoshida City, Yamanashi Prefecture)
 - Date: August 30, 2019 (to be confirmed).
 - Details will be announced soon.
- Stay tuned!

**IEEE Tokyo Section LMAG Newsletter,
No. 25, Issued on May 30, 2019**

**Issued by IEEE Tokyo Section Life Members
Affinity Group**

Kikai-Shinko-Kaikan Bldg., 517 3-5-8 Shibakoen,
Minato-ku, Tokyo 105-0011 JAPAN
URL: <https://ieee-jp.org/section/tokyo/en/about/lmag.html>