Advocate's Report: VCSEL Milestone Proposal. 2022-11

1 - As the Advocate, although Quantum Mechanics and other aspects of this proposal fall outside my Fields of Expertise, I've found the proposal comprehensive, correct and that it fullfills all the requirements to be approved as an IEEE Milestone.
It was a novel invention and an innovative development which lead to reliable manufacturing techniques and many useful products in the market which in turn represented significant benefits to the humanity.
There is a Tokyo patent, and also an impressive amount of peer-reviewed papers [spanning 1978 to 2020] that support the proposal, including an invited paper to the "Proceedings of the IEEE" in 2003 [ref A23]
All the four independent reviewers from the US and Europe have also expressed their approval and their credentials indicate they are experts in the matter.

2 - Re:Year on the tittle The proposal says Kenichi Iga conceived the idea in 1977, but first got it working in 1979 [reference A7: First Lasing] so it may be considered if 1979 should be the year mentioned in the title; in my opinion a range would be adequate, 1977 - 1979. Although it was an on-going work into 1988 [and beyond?]. Those early Laser effect were obtained in somehow extreme conditions, but further development and innovation made it possible to work in normal conditions; useful products and further developments then started to appear.

3 - There had been other more or less independent and somehow contemporaneous developments which are properly covered in the proposal, specially on the included

table I [and in Table II of ref A2]. There was a patent applied by Xerox a few months before to the Tokio Institute's application but apparently that work wasn't continued and did not lead to any success. And the Xerox corporation itself also recognized Iga's work by awarding him a prize.
In addition, all the 4 reviewers have confirmed the particular significance of Iga's work.

4- The placement of the plaque [and its replica] seem adequate; japanese are notoriously careful with stone placing in open spaces.

5 - Re: Citation,To start the Citation with a personal name did not seem appropriate; So I suggested and the proposer accepted changing the first phrase -mentioning VCSEL first and shifting Iga's name to the end of the sentence. He further argues that "Tokyo Institute of Technology" is usually referred to without any article "the" before, and that the article should not be in that first sentence of the Citation.It means one word less. There was also some minor editing in the rest of the text.Reviewer Dr. Kent Chorquette. [Univ. of Illinois] observed that the last phrase of the originally proposed citation is rather long.In fact with the proposer we had already changed it-almost the same wording, and adding two broad-minded examples as follows:

The Vertical-Cavity Surface-Emitting Laser (VCSEL) was conceived by Kenichi Iga of Tokyo Institute of Technology in 1977. The device was designed for single-mode operation, easy monolithic manufacturability, and frequency tunability. His team made breakthroughs with the first current-driven VCSEL in 1979, room temperature continuous operation

in1988, and mechanical continuous frequency tuning in 1992. VCSELs gained wide usage in everyday applications, including datacenters and optical sensing. (66-words)

I'm also uploading this revised Citation -which has the full agreement of the proposer- as a distinct document into the Discussion Page

6 - In my opinion the inclusion of Kenichi Iga's name in the citation is justified by his pioneering invention and innovative work, which has resulted in many useful applications.

This has explicitly been confirmed by the reviewers, and as his participation was pivotal in the achievement in my opinion the requisites are met, and Kenichi Iga deserves being mentioned in the Citation.
In addition he has already received several awards, including IEEE's Edison Medal in 2021 precisely for his contribution related to the VCSEL.

7 - Incidentally, when I wanted to suggest a change in the citation my e-mails to the original proposer, Dr. Kohroh Kobayashi, were not answered. I had been copied of the list of suggested reviewers, and in the message trail there was a Dr Fumio Koyama, so being afraid something could be amiss, I re-sent the message to him. As answer, I got informed by him that unfortunately Dr. Kobayashi had a medical condition and would not be able to follow-up as proposer and he, Fumio would take his place; from that moment I have interacted with him in the change of the Citation.

Submitted by Juan Carlos Miguez, November 5, 2024