References


Prof. Itoh’s Contributions to Metamaterials

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Back in 1999, I was finalizing my Ph.D. degree thesis at the École Polytechnique Fédérale de Lausanne (EPFL)—a theoretical study on photonic bandgap (PBG) structures—and trying to determine what I would do next in terms of my professional life. Because I had a particular interest in research, the prospect of a postdoctoral position soon emerged as a quite natural choice, and Prof. Itoh and his group seemed to me a dream team to join, given their prestigious reputation and ground-breaking achievements in the area of PBGs—particularly, the so-called uniplanar-compact PBGs (UC-PBGs). As the recipient of a postdoctoral grant from the Swiss National Science Foundation and upon proper introduction by Prof. Juan Mosig, then head of the Electromagnetics and Acoustics Laboratory at EPFL and author of a chapter on the integral equation technique in the widely known text Numerical Techniques for Microwave and Millimeter-Wave Passive Structures [S18] edited by Prof. Itoh, I had the chance to be admitted to the University of California, Los Angeles (UCLA) Microwave Electronics Lab without having ever having met or spoken to Prof. Itoh.

Our first encounter occurred in April 2000 at the Millennium Conference on Antennas and Propagation in Davos, Switzerland. I was so impressed by this illustrious personage that the best I could do when I approached him to introduce myself, between two technical sessions, was to stutter unintelligible words in my “approximate” English. Yet I was quickly made comfortable by his serene attitude, kind smile, and soft words, and my connection with the famous Prof. Itoh was made! A few minutes later, I was attending his invited talk on UC-PBGs in a special session focusing on periodic structures. I found this talk so inspiring that I still remember a shiver going down my spine at some point during the presentation. Prof. Itoh’s style—characterized by a harmonious blend of simplicity, brevity, clarity, ingenuity, creativity, and practicality—is unique, exquisitely contrasting with the verbose, convoluted, or pedantic styles often prevalent in academia. That night, I slept particularly well, feeling that I had found the providential supervisor for my future!

Six months later, I landed in Los Angeles and started up my postdoctoral work under Prof. Itoh at UCLA. During the first few months, I did not see him very much, as he was extremely busy with ongoing projects and travels around the world for conferences, invited talks, and other business. However, I heard a number of stories about him: for example, that he would often come directly from the airport to the lab after an overseas trip or that he would sometimes declare that “research is seven days, 24 hours.” I was immediately struck by his formidable dynamism and exceptional dedication to research. I particularly remember the famous Wednesday evening group meetings in the Faraday Room—Engineering IV

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Around that time, a U.S. Department of Defense Multidisciplinary University Research Initiative grant materialized—the first program on metamaterials ever—grouping stellar professors who had already made pioneering contributions in the area of PBGs (or photonic crystals), including X. Zhang, D.R. Smith, E. Yablonovitch, J.B. Pendry, J.D. Joannopoulos, and, of course, Prof. Itoh. This was the beginning of a most stimulating and hectic experience. Prof. Itoh injected substantial resources in the project. As a result, we collectively discovered an amazing number of novel CRLH-related effects and applied them to myriad microwave devices (e.g., couplers, resonators, multiplexers, active circuits, planar lenses, feeding networks, and resonant and leaky-wave antennas) with unprecedented properties or/and performance. This work led to the most cited paper in IEEE Microwave Magazine [S21] and to the book Electromagnetic Metamaterials, Transmission Line Theory and Microwave Applications [S22], which has received over 3,500 citations to date. None of these developments would have been possible without Prof. Itoh’s very special research approach, sharply focusing on novelty and practicality, that constantly guided and fueled the team’s progress.

As is apparent from this account, I have been deeply marked by Prof. Itoh. As my mentor, he has played a key role in my professional development, and I seize this opportunity to express my deepest gratitude for his teachings, trust, and support. However, I am only one of the uncountable scholars who have been stimulated, influenced, and inspired by Prof. Itoh over the course of their careers and lives. Among those scholars are his alumni, who form the “Dragon Gate Club” (http://www.mwlab.ee.ucla.edu/directory.html), a name that metaphorically represents Prof. Itoh’s lifetime commitment to help people passing through difficulties (gates guarded by dragons) toward success. Incidentally, the name Tatsuo turns out to mean “dragonman.” Prof. Itoh is indeed a dragon (in Chinese tradition, dragons symbolize power, strength, and good luck, and outstanding people are often compared to them): one can only stand in awe of his accomplishments, which seem almost superhuman. His IEEE Electromagnetics Award represents a most deserved recognition for this true giant, who will have left an eternal mark in the history of electromagnetics science and technology.

References