## Professor Jean Van Bladel: A True Gentleman, Book Writer and Researcher

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### Abstract

Prof. Jean Van Bladel, who received the 1997 IEEE Antennas and Propagation Society Distinguished Achievement Award and 1995 Heinrich Hertz Medal of IEEE, passed away on January 20, 2018 at the age of 95. This paper is a tribute to his legacy based on a eulogy written by his daughter Sigrid and my interactions with Prof. Van Bladel which have significantly influenced my professional career. Jean was an eloquent writer, superb teacher and first rate researcher whose work particularly on the subjects of mathematical aspects of electromagnetism and understanding the fundamentals has served generations. His books are considered classics and have inspired many electromagnetic and antenna enthusiasts.

### **1** Family and Education

Prof. Jean Van Bladel was born in Antwerp, Belgium on July 24, 1922, and passed away on January 20, 2018 in Westende, Belgium. He is survived by his loving wife Hjördis and three children Viveca, Eric and Sigrid, as well as four grandchildren.

Early life: Jean Van Bladel grew up in Antwerp in a French speaking family, the son of a respected barrister and judge. He graduated from the St. Louis High School in Brussels in 1939 and from there gained acceptance to the highly selective Military School; he was a freshman engineering student there when World War II broke out. As a volunteer soldier, Jean was forced, under perilous circumstances, to flee with his military school cohort to the South of France. Given the green light to repatriate to Belgium months later, their return train was instead intercepted by the Germans and detoured to Poland, where Jean promptly became a prisoner of war at the age of 18. Returned from captivity later that year, Jean was able to resume his engineering studies at the Université Libre de Bruxelles (ULB), but soon had to transfer to the University of Liège when the rector of the ULB refused to collaborate with the German occupiers and closed the University's doors in protest. After numerous interruptions, including re-enlisting as a volunteer sol-







Figure 2. Hjördis and Jean.

dier toward the end of the war, Prof. Van Bladel obtained his engineering degree from the ULB in 1947. After winning one of only seven much coveted scholarships from the newly established Belgian American Exchange Foundation, he headed for the United States in September 1948 to pursue his graduate studies. Figures 1a and 1b show young and seasoned Van Bladel and Figure 2 shows Hjördis and Jean. *Higher Education*: Jean Van Bladel received his MS and PhD degrees in electrical engineering from the University of Wisconsin-Madison in 1949 and 1950, respectively, and served on the faculty from 1956 to 1964. He subsequently founded the electromagnetics research group at Ghent University in Belgium and brought much prominence to this university before his retirement in 1987. His research covered vast areas of fundamentals in electromagnetics and relativity, including advanced engineering mathematics. His books are considered classics and have inspired countless number of researchers and students.

## 2 How Prof. Van Bladel Influenced My Career

My main interactions with late Prof. Van Bladel were at many URSI General Assemblies and IEEE Antennas and Propagation Symposia. Perhaps the first time I got to know him and his family was during the URSI General Assembly held in Washington DC, August 1981. My interests in the subject matters of Dyadic Green's functions, singularities, distribution theories, relativity and scattering from apertures allowed me, as a young researcher, to have in-depth discussions with Jean, and subsequently develop a lasting friendship. Every year we had exchanged happy New Year cards and I still have many of them with his beautiful hand writing. On one occasion he invited me to his university and asked me to give a talk and he was gracious to ask me to stay at his house where I got to know his lovely family better. He was by all accounts the true gentleman because of his manners and style and his nature of helping others. I know for sure that he wrote several strong reference letters on my behalf, helping me to receive the coveted URSI Henry Booker Gold Medal at the 2000 URSI General Assembly held in India in the presence of India's President, Abdul Kalam. Subsequently he nominated me to become a Foreign member of the Royal Flemish Academy of Belgium for Science and the Arts. This is a huge honor and I am certain that without Prof. Van Bladel's support I would have not been elected. He also invited me to be one of the plenary speakers at the URSI 75th celebration in Belgium held in the presence of the King of Belgium. Clearly Jean's support of my activities elevated my position in our community, and for that, I am indebted to him forever. There was an 80th birthday special issue of URSI Radio Science Bulletin edited by Dr. Ross Stone and Jean's former students honoring Prof. Van Bladel and I contributed a paper to that issue [1]. See the cover page of this issue in Figure 3. Later on Jean wrote to me and was appreciative of the article and quite interested in the topic. See the note that he subsequently and elegantly wrote, Figure 4. Among some photos that I have with Jean, the one shown in Figure 5 is perhaps the most interesting. I believe it was taken in a tavern somewhere in Europe in late 80's or early 90's. In this photo two of Jean's former Ph.D. students, namely, Prof. Chalmers Butler and late Prof. K. K. Mei were also at the table.



**Figure 3.** Cover page of the 80th birthday special issue of URSI Radio Science Bulletin honoring Prof. Van Bladel's scientific life. I had a paper in this special issue on the topic of Particle Swarm Optimization appearing on the cover page. The issue was edited by Dr. Ross Stone and Prof. Van Bladels former students and published in Sept. 2003.

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**Figure 4.** A segment of Prof. Van Bladel's two-page hand written letter to me, dated October 3, 2003, about my article in the special issue. He wrote, "The topic of PSO was unknown to me, and I definitely want to present it, in most concentrated form of course in one of the chapters of my second edition".

### 3 Research, Text Books and Awards

After establishing the electromagnetic group at Ghent University, Belgium, Prof. Van Bladel's main research interests continued in the field of electromagnetics, antenna theory, relativity, singularities and dyadics and others. Together with his students and colleagues, Jean contributed to fundamental aspects of some difficult topics in electromagnetic theory. It is also considered that he and his student, late Prof. Mei, might have introduced the first appli-



**Figure 5.** From front right to left are: Prof. Jean Van Bladel, Prof. K. K. Mei (former student of Jean), Yahya Rahmat-Samii, Prof. Bach Andersen, and Prof. Chalmers Butler (fromer student of Jean). The photo was taken in a tavern somewhere in Europe either late 80's or early 90's.

cation of method of moments in the numerical characterizations of scattering problems [2]. The summary of the paper reads, "The problem of determining the fields scattered by a perfectly-conducting rectangular cylinder is reduced to the solution of an integral equation. This equation is then solved by digital computer methods. Data are given for surface currents, radiation patterns and scattering cross sections for both E- and H- incident waves." His first text book entitled, "electromagnetic fields" published in 1964 [3] is a classic and subsequently he expanded that book to something very monumental and published it in 2007 [4]. This is perhaps one his last major contributions and has been reviewed by Prof. Uslenghi in the IEEE antennas and Propagation magazine [5]. In his review he wrote, "In 2007, the IEEE Press published a second and much expanded edition of Electromagnetic Fields, which took the author a decade to prepare, but turned out to be worth waiting for. This second edition is about three times the size of the original version, with a much-expanded and updated bibliography and set of appendixes. It consists of seventeen chapters, each with its own bibliography and with a set of problems that make this book well suited not only as a reference source, but also as a textbook for advanced courses in electromagnetism". I am one of the lucky ones in possession of an original copy of the first edition and subsequently the second edition. I have used these books when I was a student and subsequently as a researcher and educator. The subject matters are discussed very rigorously and elegantly. His other text books on relativity [6] and singularity in electromagnetics [7] are very fundamental and unique as well. Figures 6-8 show the cover pages of these books.

An IEEE Fellow and the recipient of the IEEE AP-S Distinguished Achievement Award, he attended many IEEE AP-S conferences. I believe the last one he participated was the one held in Hawaii in 2007. He played a major role in advancing the aspirations of URSI by serving as the Secretary



**Figure 6.** Prof. Van Baldel's classic book on "Electromagnetic Fields". (a) First edition in 1964 and (b) Second edition with much expansion in 2007.



**Figure 7.** Prof. Van Bladel's book on "Relativity and Engineering" published in 1984.

General of URSI for 14 years. He contributed immensely to the well-being of URSI by tirelessly helping the organization in many successful URSI General Assemblies. Figure 9 shows Prof. Van Bladel elegantly talking about the state of URSI at the XXIVth URSI General Assembly held in Kyoto, Japan in 1993 and I took this photo as a US delegate participant. His services and accomplishments were recognized with an APS Distinguished Achievement Award (1997), and a longstanding membership of the Royal Flemish Academy of Belgium for Science and the Arts.

*A note on Heinrich Hertz Medal*: Prof. Van Bladel received this medal in 1995. The IEEE Heinrich Hertz Medal was presented by the IEEE for outstanding achievements in the field of electromagnetic waves. The medal was named in honor of German physicist Heinrich Hertz. It was first proposed in 1986 by IEEE Region 8 as a centennial recog-



**Figure 8.** Prof. Van Bladel's book on "Singular Electromagnetic Fields and Sources" published in 1991.



**Figure 9.** Professor Jean Van Bladel, URSI Secretary General, delivering a talk on the state of the URSI at the Kyoto XXIVth URSI General Assembly in 1993. I took this photo as a member of US delegation participating in the assembly.

nition of Hertz's work on electromagnetic radiation theory from 1886 to 1891. The first medal was awarded in 1988, and was presented annually until 2001. It was officially discontinued in November 2009.

Among the notable recipients of the Heinrich Hertz Medal are 1988 Hans-Georg Unger; 1989 Nathan Marcuvitz; 1990 John D. Kraus, 1991 Leopold B. Felsen; 1992 James R. Wait; 1993 Kenneth Budden; 1994 Ronald N. Bracewell; 1995 Jean Van Bladel; 1996 Martin A. Uman; 1997 Owen Storey; 1998 Chen To Tai; 1999 Akira Ishimaru; 2000 Arthur A. Oliner; 2001 Adrianus de Hoop.

# 4 Concluding Remarks and Acknowledgments

Professor Jean Van Bladel touched many lives and it was indeed a pleasure to be one of his colleagues. His memory, legacy and friendship will stay with me forever. Prof. Van Bladel was the catalyst and the prime mover in creating a strong Electromagnetics group at the University of Ghent as mentioned above. His book "Electromagnetic Fields" (McGraw Hill, 1964) set by example the highest standards of intellectual pursuit amongst his colleagues.

My sincere thanks to Sigrid and Viveca Van Bladel, Jean's daughters, who furnished some of the photos and also wrote much of the materials on Jean's early life. They also were gracious to go through this paper and provide many constructive suggestions.

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