

The history of scintillator discovery and the challenges that lie ahead

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NaI:Tl discovered by Nobel Prize laureate Robert Hofstadter in 1948 [1] was the first inorganic scintillator of practical use for gamma ray detection. Since then, there has been continual research into development of better and new scintillator materials. It covers a duration of almost 80 years. I together with my PhD and postdoc students participated in that research since 1988. In this contribution, I will start with a review on the history of scintillation materials research and developments with the focus on gamma ray detection. The availability of photomultiplier tubes after the 2nd world war, the technology to chemically purify the lanthanides after 1960, the rise of Si-based detection, the rise of electronic detection capabilities have been important drivers of scintillator research throughout the years. The demands by the end users in medical diagnostics, in safeguarding and security, and in high energy physics were equally well drivers of scintillation materials research. Another driver has been our increased fundamental understanding of scintillation mechanisms and scintillator performance. After reviewing the interplay between scintillator drivers and scintillator discovery, I will try to look forward. Where are we today and what challenges lie ahead?

1. R. Hofstadter “Alkali Halide Scintillation Counters,” Phys. Rev. 74, 100 (1948).