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Birth of tunnel magnetoresistance and its development

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Nowadays usually we use the word, tunnel magnetoresistance, but it required a long time to combine both words tunnel and magnetoresistance. The study of tunnel junction may originate p-n junction studied first around 1950. On the other hand, magnetoresistance effect was reported first in 1857 which was about 100 years earlier than the start of tunnel junction study. The research of tunnel magnetoresoistance has been mainly developed first for Al-oxide tunnel barrier junctions and made a big progress by the appearance of MgO barrier junctions for both basic research and applications. More recently Heusler electrode tunnel junctions exhibits a large TMR ratio up to about 750 %. In my talk I will explain first the history of the study of tunnel junction and magnetoresistance effect. Then, I will focus on the Heusler electrode junctions and also application of tunnel magnetoresoistance junctions.