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From modelling to space missions and space instrumentation: a 40 years journey through the solar system

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My interest for planetary science was definitely triggered by the landing of Apollo 11 in July 1969, a few days before my 18th birthday. This led to a PhD thesis in the team of M. Maurette at CSNSM Orsay, dedicated to the modelling of the lunar regolith so as to interpret the results obtained by the team on lunar samples. The development of these models was the mainstay of these early years, with an application to other atmosphereless bodies: Mercury, asteroids and Martian satellites. After a while, the lack of any experimental basis for testing these new developments became quite frustrating, which led to first forays into the corridors of CNES and ESA, then to an active role in mission projects and their evaluation. In the early 1980's, the outlook was not very bright for planetary science in Europe, with the US and USSR at center stage. The situation radically changed after the success of the Giotto mission to comet P/Halley in 1986 and the set-up of a long term plan ("Horizon 2000") by ESA's director of science, R. Bonnet, which made possible an orderly planning of priorities by the planetary science community around Rosetta (initially a comet sample return mission in cooperation with NASA) then Cassini/Huygens, selected in 1988 as a "medium" mission. The next period focused on a major involvement in Mars exploration (OMEGA, PI J-P. Bibring). This was definitely a programmatic rollercoaster ride, until the major breakthroughs after MOI in 2004. In parallel, I became involved in a long winded serial with the selection in 1996 of a mission to Mercury, BepiColombo, as the next cornerstone after Rosetta, which hopefully will get to a happy end in 2025-2026. In 2014-2016, the spotlight was on the remarkable success of the orbital phase of Rosetta, additional thrill being provided by the Philae lander, while the next major mission, JUICE, was already claiming some attention with a leading role in MAJIS, the VIS-NIR imaging spectrometer.

Space science is a risky business, for which a stolid state of mind is an asset as heavy long term investments can come to naught in the blinking of an eye. However, when looking back on these 40 years, the outcome was definitely worth the efforts of the planetary science community (with a bit of luck!): Europe is now a major player in the field with missions successfully flown or planned to 10 of the 14 large planetary bodies of the solar system and a leading role in the study of comets. The next breakthroughs will require ambitious projects focused on in-situ investigations and the characterization of extrasolar planets. Whatever the difficulties, we build on a sound basis as the younger generations have access to a gold mine of outstanding data, beyond the wildest dreams I could have made early in my career.