

The NASA/ESA Cassini – Huygens mission

by

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Presentation given at:

Rotary Club Rotterdam, the Netherlands, 2011 July 27

National Aeronautics and Space Administration /

European Space Agency /

CASSINI (Saturn) – HUYGENS (Titan) mission

All that went wrong

1625 – 1712 : Giovanni Domenico **Cassini** , Italian/French astronomer
(4 Saturn moons)



1629 – 1695 : Christiaan **Huygens** , Dutch mathematician,
astronomer, physicist, horologist
(Saturn rings, Saturn moon Titan)

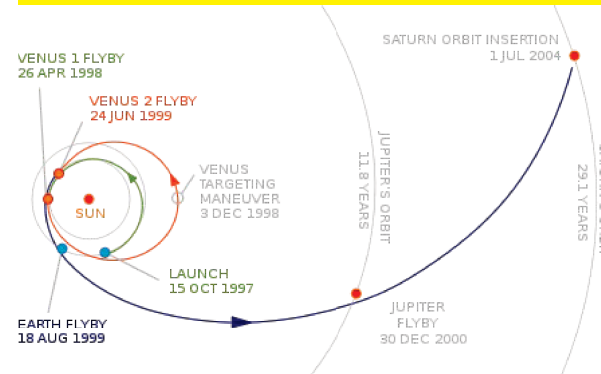


15 Oct 1997 – Saturn explorer **Cassini** and Titan landing probe

Huygens launched

– trajectory (energy build-up):

Venus – Venus – Earth – Jupiter – Saturn



– costs: **300 000 000 USD**

early 2000 – Boris Smeds (1944 – ...) Radio Engineer, ESA Darmstadt



– Critical flaw in design of (Italian brand) receiver \implies

SCRAMBLE ALL PHOTO'S

– not detected due to skipping a full-up high-fidelity test of the radio link prior to launching (NO BUDGET!)

Sep 2000 – Tests at NASA, CA, with the communication links of Cassini (two-way signal travel time 48 min) \implies Smeds is right

– **ERROR**: Digital-signal Doppler shift overlooked! (De Hoop 2009)

– Cassini's trajectory diverted

Jul 2004 – Cassini in orbit around Saturn

14 Jan 2005 – Huygens probe lands on Titan (50 % of the photo's saved!)



Huygens probe on Titan

'If anything just cannot go wrong, it will anyway'

and

'If everything seems to be going well, you have obviously overlooked something'

Murphy's law