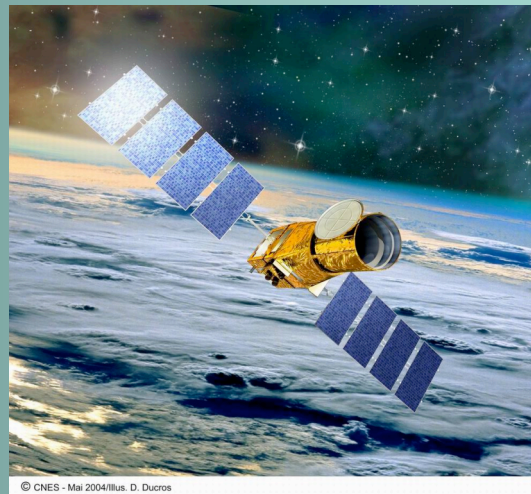
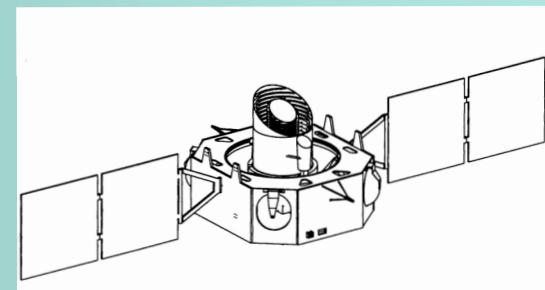
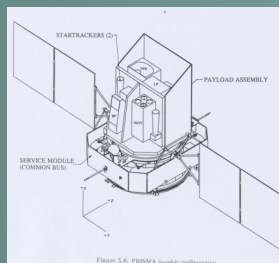
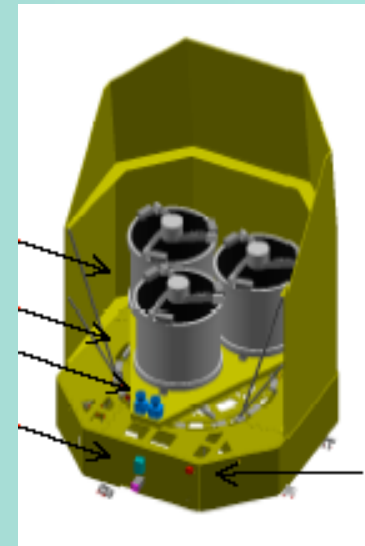


The birth of space asteroseismology in France

C. Catala & F. Praderie



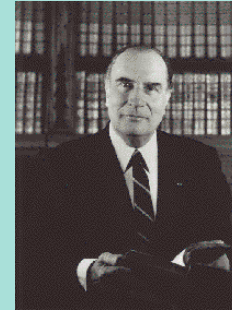
© CNES - Mai 2004/illus. D. Ducros



Genesis: 1981

May 1981

- election of François Mitterrand
- meeting near Ussel (Corrèze) of a small group of scientists on the theme « stellar magnetic activity »:
among them,
 - Françoise Praderie
 - André Mangeney
 - Meir Semel
 - Andy Skumanich
 - Elisabeth Ribes
 - Philippe Lemaire**



- dedicate a satellite for **monitoring stellar activity**
- Philippe drafted a **design for a simple spectrograph** for monitoring simultaneously Ca II K, Mg II k, He II and CIV lines

June 1981

meeting in Paris: same people + Philippe Delache + Annie Baglin
proposal for introducing a photometer, and monitor simultaneously stellar oscillations and stellar activity

First proposals: 1981-1983

A space mission dedicated to the study of stellar seismology and activity

- stellar oscillations, probing the internal structure
- rotational modulation of activity tracers, measuring surface rotation
- topology of surface magnetic fields
- vertical structure of atmospheres

Initial instrumental concept:

- white-light photometer (40 cm): variability to one ppm precision
- UV spectrograph (40 cm telescope, 0.2 Å resolution):

monitoring Ca II K, Mg II k, He II 1640, CIV 1550

EVRIIS

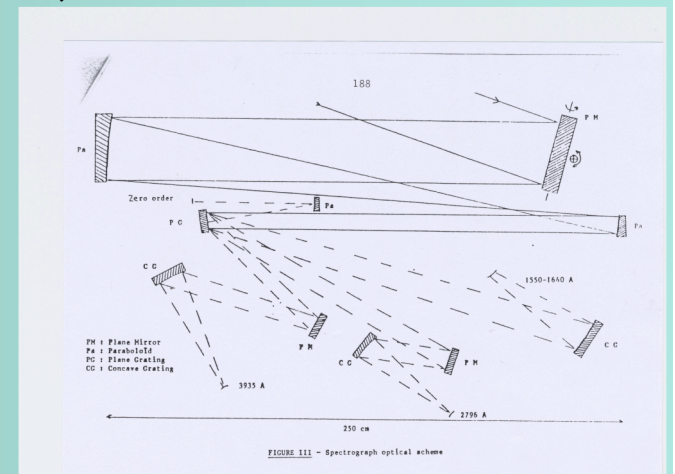


proposal at CNES prospective seminar (Les Arcs, 1981)
phase-0 (1982)

PSIVA



unsuccessful



The 2nd step: involving the international community

March 1984

space research prospects in stellar activity and variability
Observatoire de Paris - Meudon

Philippe Lemaire



Françoise Praderie André Mangeney

Continuing the quest: the PRISMA adventure

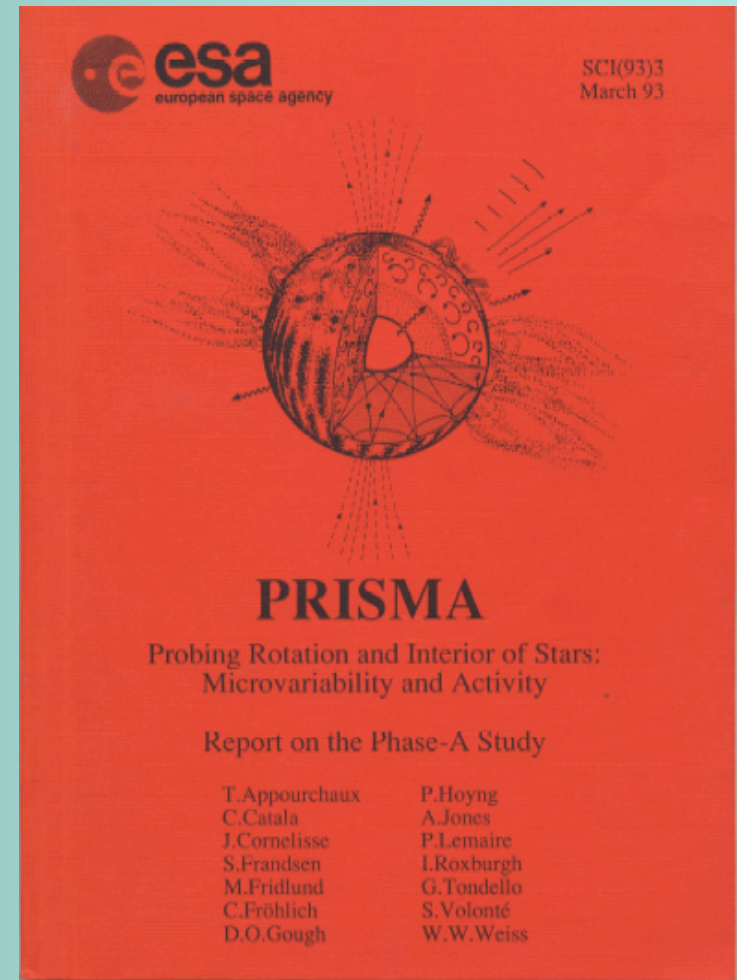
1985

first PRISMA proposal,
in the framework of « Horizon 2000 » programme,
judged not sufficiently mature, and not selected

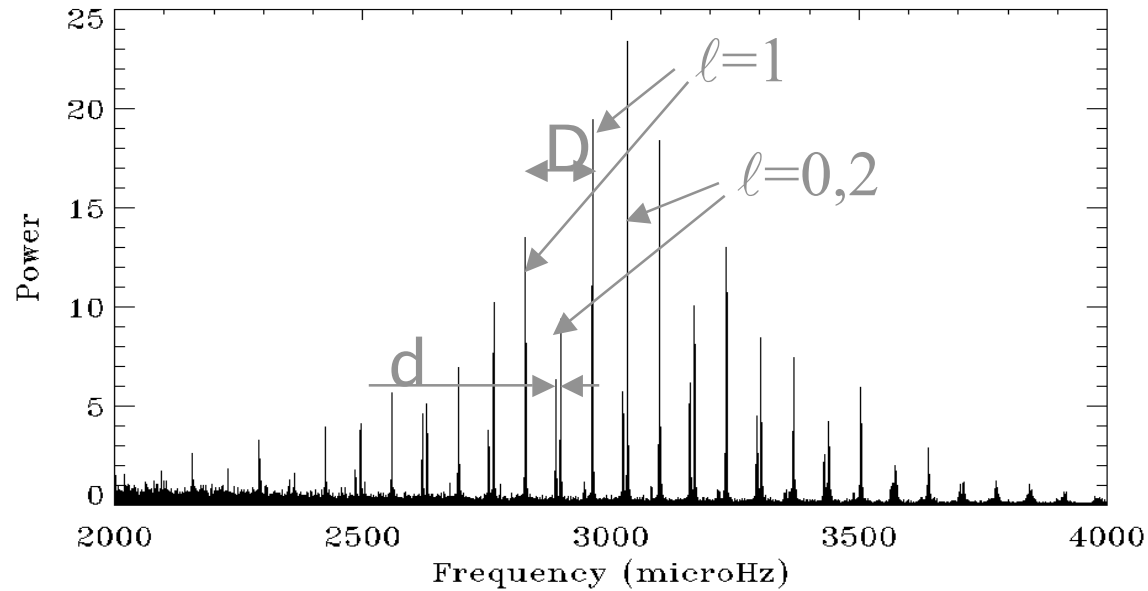
1989

second PRISMA proposal:
assessment study
phase-A → 1993
not selected as M2

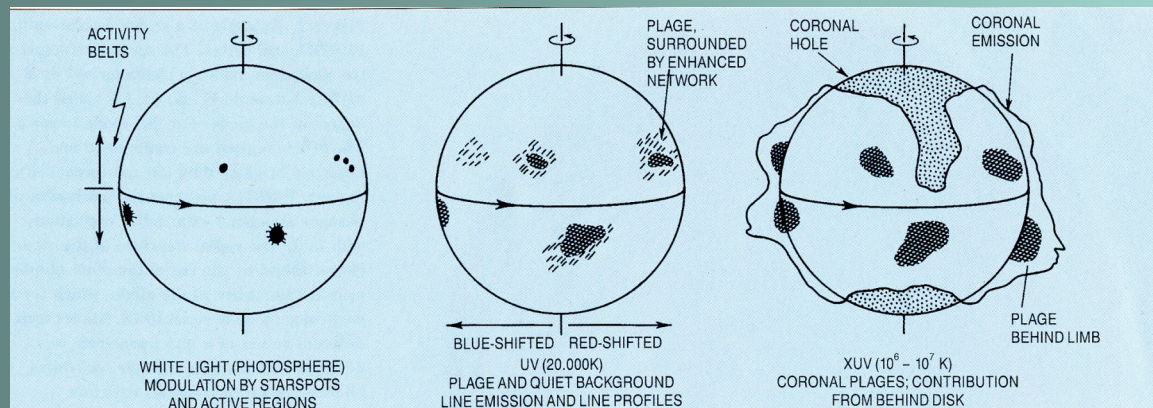
extending the concept of a dedicated space
mission for stellar seismology and activity studies



PRISMA main objectives



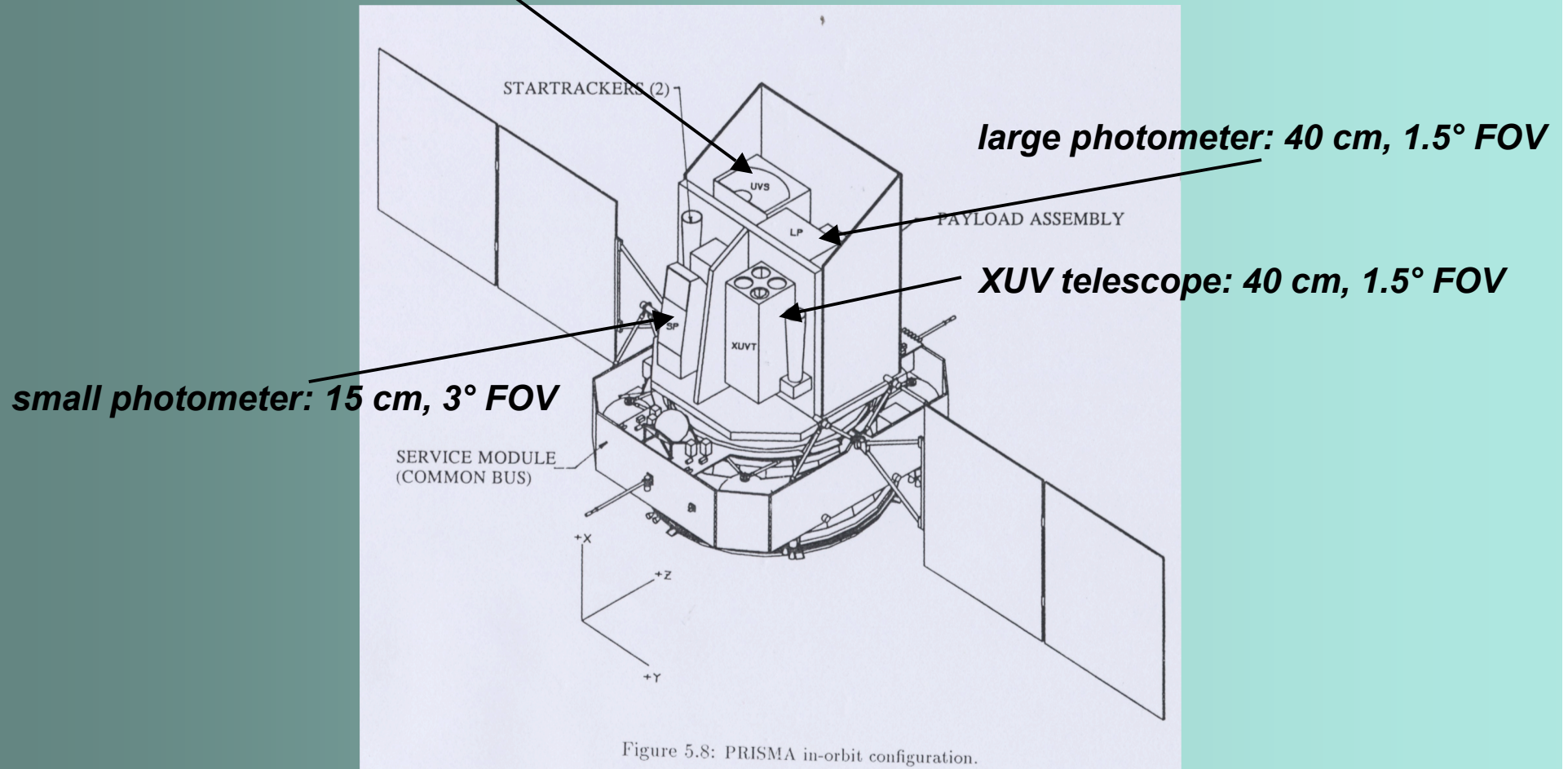
stellar interiors via seismology, providing strong constraints to stellar evolution modelling



stellar activity manifestations at various atmospheric levels, providing constraints for dynamo theories

the PRISMA concept

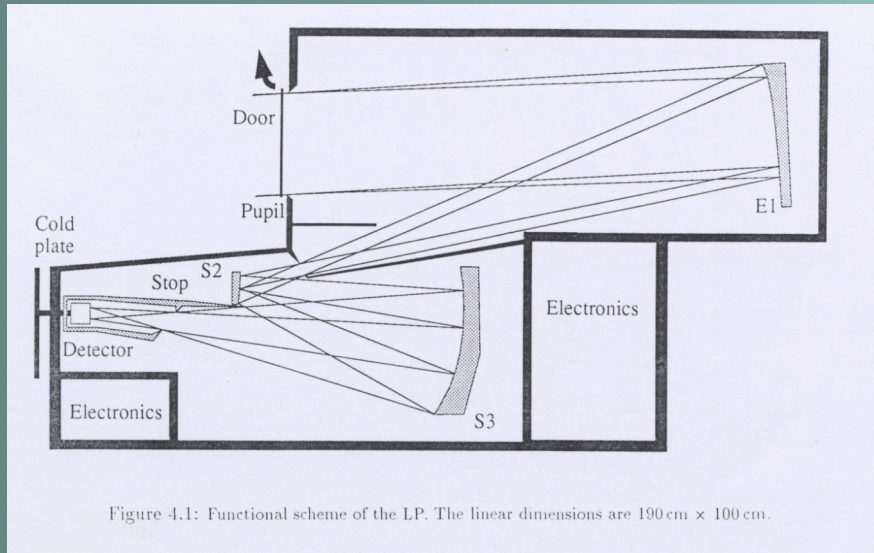
40 cm UV telescope / spectrograph: $R=30,000$; 120 -285 nm



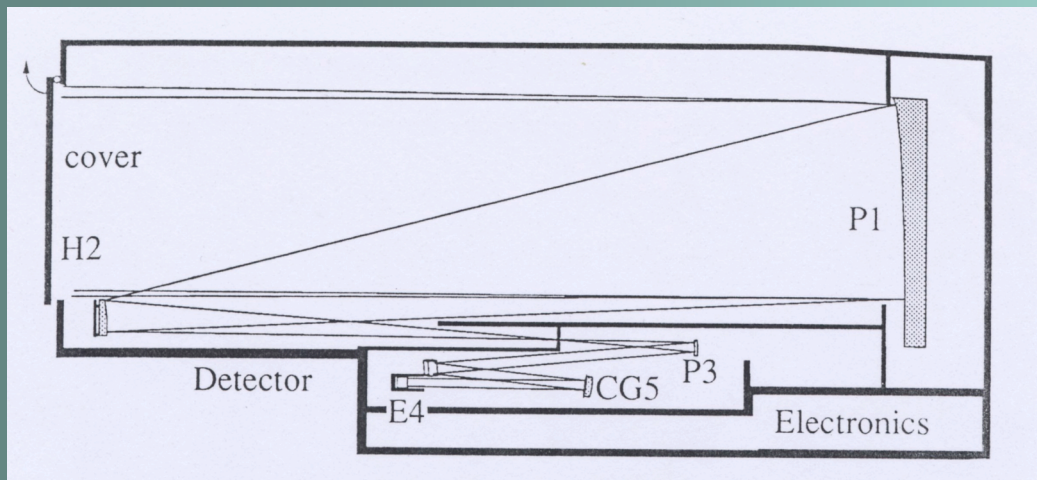
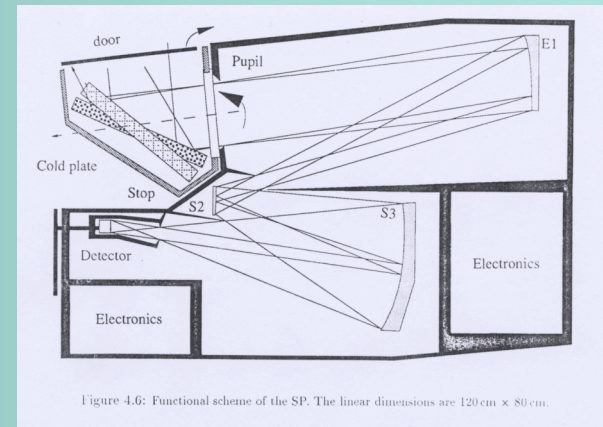
LP + UVS + XUVT monitoring the same fields
SP monitoring other fields thanks to entrance coelostat

the PRISMA instruments

large photometer: 40 cm, 1.5° FOV



small photometer: 15 cm, 3° FOV



UV spectrograph: 40 cm

+ 40 cm XUV telescope
1.5° FOV

the heritage

After PRISMA (1993), Philippe's involvement in stellar seismology studies decreased progressively, but the adventure continued, building on the heritage of these pioneering years.



EVRIS: 9 cm photometer,
onboard Mars 96,
lost after orbit injection failure

COROT: photometry,
first proposal 1993,
new design 1996 (seismology + exoplanets)
launch 2006



STARS: photometry (visible + UV),
asteroseismology, stellar activity, (+exoplanets)
phase-A study
not selected as M3 (1996)

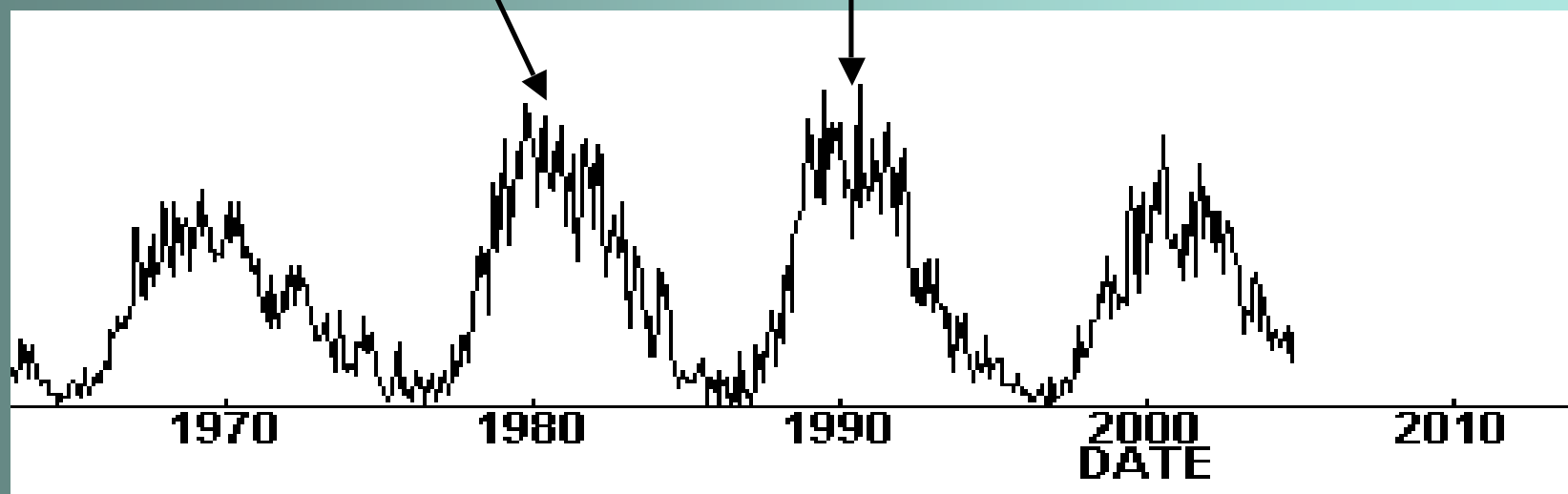
Eddington: photometry,
asteroseismology + exoplanets
status still uncertain

The original idea to couple stellar seismology and stellar activity studies is still present in the currently planned missions COROT & Eddington

Philippe's activity cycle

First EVRIS/PSIVA proposals

PRISMA studies



Merci Philippe, pour le rôle majeur que tu as joué dans les débuts de l'astérosismologie spatiale.

Merci de nous avoir accompagnés et guidés dans cette belle aventure, qui est loin d'être terminée, et dont nous espérons que tu continueras à suivre les développements .