WG 4: Close proximity operations

Co-chairs: Stephan Ulamec (DLR), Özgür Karatekin (ROB), Naomi Murdoch (ISAE-SUPAERO)

“Define payload operational constraints to acquire the measurements in agreement with mission measurement requirements and payload requirements."

WG 4: Tasks/Objectives

a) Design close-proximity trajectories compatible with the required mission measurements and their accuracy (using inputs from other WGs).

b) Provide payload operational constraints to the ESA operations team.

c) Iterate requirements with both the payload development teams and the prime of the phase B1 study.

d) Provide a first payload operations plan for the Didymos encounter

e) Support the identification of possible flyby targets for the Hera cruise phase

f) Provide input to the end-to-end payload data simulator (WG “Data analysis”)

Expected outputs:

- Contribute to the Hera system requirements document
- Contribute to the Hera payload operations document
- Hera operations Plan

Name	Last Name	Affiliation	Expertise
Tom	Andert	Univ. Bundeswehr	Radio Science
Patrick	Bambach	MPS	Cubesat, radar
Cesar	Bernal Franco	ISI Space	Cubesat deployer
Jens	Biele	DLR MUSC	payload operations, lander if any
Kieran	Carroll	Gedex	Gravimetry
Valerie	Ciarletti	LATMOS	Radar
Jakob	Deller	MPS	Cubesat
Albert	Falke	Airbus	Systems engineering, spacecraft design
Yoshifumi	Futaana	Swedish Institute of Space Physics	Space plasma/planetary neutral particles data exploitation
Jesús	Gil Fernandez	ESA/ESTEC	Navigation
Hannah	Goldberg	Gomspace	Juventas cubesat
Graciela	Gonzalez	Univ. Bundeswehr	Radio Science
Paulo	Gordo	Univ. Lisboa	Lidar
Simon	Green	Open University	Instrumentation, IR
Björn	Grieger	ESA/ESAC	Sci. Ops., obs. and physical modelling
Carsten	Güttler	MPI for Solar System Research	Cameras, Operations, small scale properties
Alain	Herique	Université Grenoble Alpes	Radar
Daniel	Hestroffer	Paris observatory	Radio science ; CubeSat
Akos	Kereszturi	Hungarian Academy of Sciences	Meteorite laboratory studies
Tomas	Kohout	Univ. Helsinki	Cubesats, mineralogy, surface geology
Michael	Küppers	ESA/ESAC	Sci. Ops., cameras
Michelle	Lavagna	Politecnico di Milano	Impact model, instrumentation
Patrick	Michel	Obs. Cote d'Azur	Impact, space missions
Pascal	Rosenblatt	ACRI-ST	Radio Science
Stephen	Schwartz	Obs. Cote d'Azur	Impact modelling
Holger	Sierks	MPI for Solar System Research	Cameras, Operations
Paolo	Tortora	Univ. Bologna	Radio Science
Cecilia	Tubiana	MPS	Operations, groundbased observations
Jean-Baptiste	Vincent	DLR Institute for Planetary Research	Cameras, Surface morphology, shape visualisation
Jan-Erik	Wahlund	Swedish Institute of Space Physics	Cubesats

WG 4: Current member list

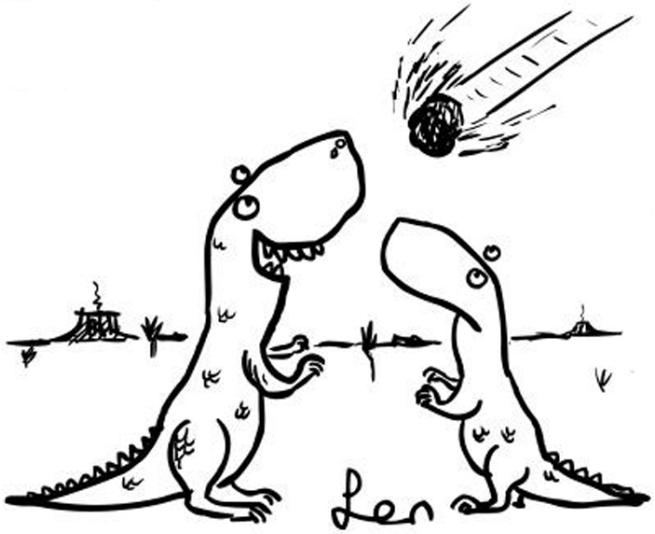
Let us know if you think that you should be on this list!

WG 4: Member contributions

- All WG4 members who have indicated that they wish to actively participate: please start thinking about how you can contribute to the WG4 tasks. We will be contacting you soon!

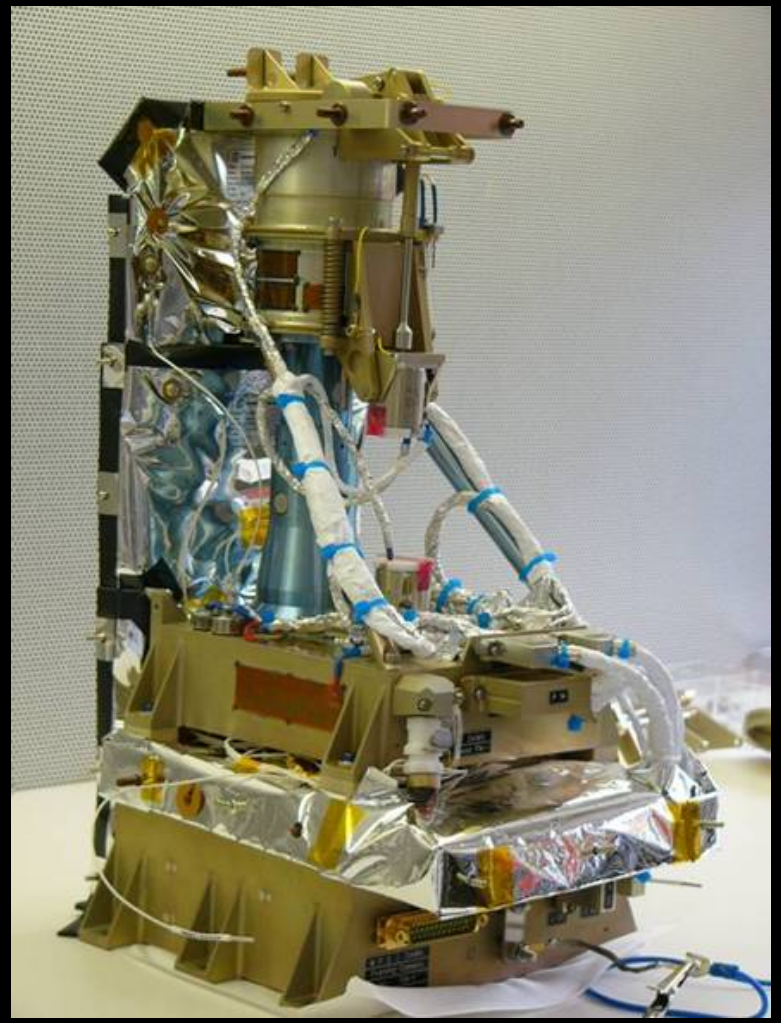
- We would also welcome new members who can contribute to the WG4 tasks.

- If you would like to join, please contact us:
  - stephan.ulamec@dlr.de
  - ozgur.karatekin@observatory.be
  - naomi.murdoch@isae.fr



"Ooh, look! A shooting star.
Make a wish."

Dawn Framing Camera



Item	Specification
Focal Length	150 mm
F-Number	7.5
Encircled Energy	>80% inside a pixel of 14 µm sq.
BFL	19 mm
Focal Shift	<20 µm wrt. channel 4
Field of View	5.5° × 5.5°
IFOV	93.7 µrad
Field Curvature	<10 µm
Distortion	<0.1%
Spectral Range	400–1050 nm
Spectral Transmission	>75%

Sierks et al. (2011)

Dawn Framing Camera @ Didymos

Distance [m]	Resolution [m/px]	Footprint size [m^2]	# images for Didymos coverage	# images for Didymoon coverage
100	$9.4\ 10^{-3}$	9.6 x 9.6	20762	874
316	$3.0\ 10^{-2}$	30 x 30	2076	87
1000	$9.4\ 10^{-2}$	96 x 96	208	9
3162	0.30	303 x 303	21	~ frame filling
10,000	0.94	959 x 959	~ frame filling	< frame filling

Requirements (from former AD50 document):

- Didymoon @ 50 cm/px globally (S.AFC.3.p4) translates to 5 km distance
- Didymoon @ 10 cm/px locally (S.AFC.3.p5) translates to 1 km distance

AFC Qualification Model @ GNC Tests