

Characterization of the refractory organic matter present in the dust particles of 67P/Churyumov-Gerasimenko.

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ABSTRACT

The COmetary Secondary Ion Mass Analyser (COSIMA), a miniaturized time-of-flight secondary ion mass spectrometer (ToF-SIMS), is one of the dust particle instruments onboard the orbiter of the Rosetta mission that studied the comet 67P/Churyumov-Gerasimenko during 26 months. COSIMA has analysed the mineral and organic composition of dust particles that were captured on metal targets exposed to space.

The mass spectra acquired by COSIMA show that refractory organic matter is ubiquitous in cometary dust particles (Fray et al., 2016 and Bardyn et al., 2017). We will review the results related to the elemental composition and the nature of the carbonaceous material which composed the cometary dust particles (Fray et al., 2017 and Isnard et al., In Press). These results obtained on the dust particles of 67P will be compared to those from other astrophysical objects (carbonaceous chondrites, Interplanetary Dust Particles (IDPs), micro-meteorites). This comparison seems to indicate that the cometary organic matter is less altered than the insoluble organic matter extracted from chondrites.

Bardyn A. et al. (2017) Carbon-rich dust in comet 67P/Churyumov-1 Gerasimenko measured by COSIMA/Rosetta

Monthly Notices of the Royal Astronomical Society, 469, S712-S722

Fray N. et al. (2017) Nitrogen to carbon atomic ratio measured by COSIMA in the particles of comet 67P/Churyumov-Gerasimenko.

Monthly Notices of the Royal Astronomical Society, 469, S506-S516

Fray N. et al. (2016) High-molecular-weight organic matter in the particles of comet 67P/Churyumov-Gerasimenko

Nature, 538, 72-74

Isnard R. (In Press) H/C elemental ratio of the refractory organic matter in cometary particles of 67P/Churyumov-Gerasimenko.

Astronomy and Astrophysics

rosetta swt meetings

Rosetta SWT (/web/r... SWT 52 (https://www... Schedule

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The meeting will be held at the ESACPE Tennis Hall at ESTEC.

MONDAY, 23 Sept 2019		TUESDAY, 24 Sept 2019		WEDNESDAY, 25 Sept 2019		THURSDAY, 26 Sept 2019		Friday, 27 Sept 2019	
		09:30	TALKS	10:00	SWT	09:30	TALKS	09:30	TALKS
		10:45	COFFEE	10:45	COFFEE	10:45	COFFEE	10:45	COFFEE
		11:30	TALKS	11:30	SWT	11:30	TALKS	11:30	TALKS
		13:00	LUNCH	13:00	LUNCH	13:00	LUNCH	12:30	END
14:00	TALKS	14:00	TALKS	14:00	SWT	14:00	TALKS		
15:30	COFFEE	15:30	COFFEE	15:30	COFFEE	15:30	COFFEE		
16:00	TALKS	16:00	TALKS	16:00	SWT	16:30	TALKS		
17:30	END	17:30	END		END		END		
18:00	ICE BREAKER			18:00	Conference Dinner	20:00			
20:00									

Monday 23 Sept 2019	Title
14:00	Intro
14:20	The Anhur region: pristine exposure of volatiles
14:40	Multi-instrument analysis of FUV emissions during solar events at c
15:00	The inner dust and gas comae of comet 67P from a multi-instrumen
15:20	Discussion
15:30	Coffee
16:00	A duck with HiPS - Towards a 67P basemap as Hierarchical Progress
16:20	Light scattering and thermal emission modelling of dust in 67P
16:40	The outgassing morphology of comet 67P from MIRO maps
17:00	Review of rotating non-spherical dust modelling calibrated with Ros
17:20	Discussion
17:30	End
18:00	ICE BREAKER
Tuesday 24 Sept 2019	

09:30	Characterization of a two-electron temperature plasma in the ionosph
09:50	Dynamic field line draping at comet 67P/CG during the Rosetta daysid
10:10	'The infant bow shock - where and when does it exist?'
10:30	Discussion
10:45	Coffee
11:30	Polarisation of a small scale cometary plasma environment: Particle in
11:50	Steepening of Magnetosonic Waves in the Inner Coma of 67P/Churyum
12:10	Kinetic simulations of the interaction between the solar wind and a co
12:30	Discussion
13:00	Lunch
14:00	The whole mission in your workspace: RPC-ICA moment data and wha
14:20	Mechanical Properties of 67P/Churyumov,ÄiGerasimenko surface mat
14:40	Dust Particle Tracking at Comet 67P/Churyumov,ÄiGerasimenko
15:00	Bulk composition of volatiles versus early mission data from ROSINA
15:20	Discussion
15:30	Coffee
16:00	Characterization of the refractory organic matter present in the dust p
16:20	Post-rendezvous radar properties of comet 67P/CG from the Rosetta f
16:40	Dust-to-gas and refractory-to-ice mass ratios of comet 67P/Churyumo
17:00	How Comets Work
17:20	Discussion
17:30	End
Wednesday 25 Sept 2019	
10:00	SWT
11:00	Coffee
11:30	SWT
13:00	Lunch
14:00	SWT
15:30	Coffee
16:00	SWT
17:00	END
18:00	Dinner
Thursday 26 Sept 2019	
09:30	The CoPhyLab
09:50	Anomalous oxygen isotopes in O2 and SO/SO2
10:10	Analysis of the present state of the dusty gas coma modelling
10:30	Discussion
10:45	Coffee
11:30	3D viewer of comet 67P/Churyumov-Gerasimenko
11:50	Metal depletions in 67P,Äs dust: a new insight into primitive dust cor
12:10	What glycine distributed source in 67P could tell us about the formati
12:30	Discussion
13:00	Lunch

14:00	Short-term outbursts on 67P/ Churyumov-Gerasimenko and 2060 Chir
14:20	The subunit size distributions of dust of comet 67P at the nanometre r
14:40	The D/H Ratio Measured in the Dust of Comet 67P/ Churyumov-Geras
15:00	CN/HCN Ratio Seen with DFMS/ROSINA in the Inner Coma of Comet 6
15:20	Discussion
15:30	Coffee
16:00	Ingredients for Solar-like Systems: protostar IRAS 16293-2422 B versus
16:20	Quantification of Li abundance in the dust particles of 67P/Churyumov
16:40	LICIACube mission overview and modelling dust dynamics of the plum
17:00	A large chunk in temporary orbit around comet 67P
17:20	Discussion
17:30	End
Friday 27 Sept 2019	
09:30	Sources of volatiles and dust on 67P: a cross instrument comparison
09:50	From large interstellar organics to comets and prebiotic delivery
10:10	Bulk composition of volatiles versus early mission data from Rosina
10:30	Discussion
10:45	Coffee
11:30	Open questions in cometary plasma physics
11:50	Predicted activity of a dynamically new comet ,Äi application for the p
12:10	Comet Interceptor - current status
12:30	Discussion + wrap up + end

POSTERS-

Posters boards are provided in the main meeting area and will be up all week.

Due to the number of posters we will not have a dedicated poster session, but instead utilise the ice breaker and coffee breaks etc for poster interactions.

Lemos - Global distribution and dynamics of dust near comet 67P/Churyumov-Gerasimenko

Odelstad- Plasma waves near the diamagnetic cavity of 67P

Bucciattini- RPCMIP/RPCLAP CROSS-CALIBRATED DENSITY DATASET

Myllys- Electric field measurements at plasma frequency and their solar wind drivers at comet 67P

Schroeder- A comparison between the two lobes of comet 67P / Churyumov-Gerasimenko based on D/H ratios in H₂O measured with the Rosetta / ROSINA DFMS

SWT Schedule -

SWT #52 - Wednesday 25 September 2019

Start 10:00