Atmosphere of the Earth - Earth's atmospheric & Space Environment

SPAT0055 - SPAT0048

Space Sciences - Aerospace engineering

~~SPAT0029 (Nov. 2023)~~

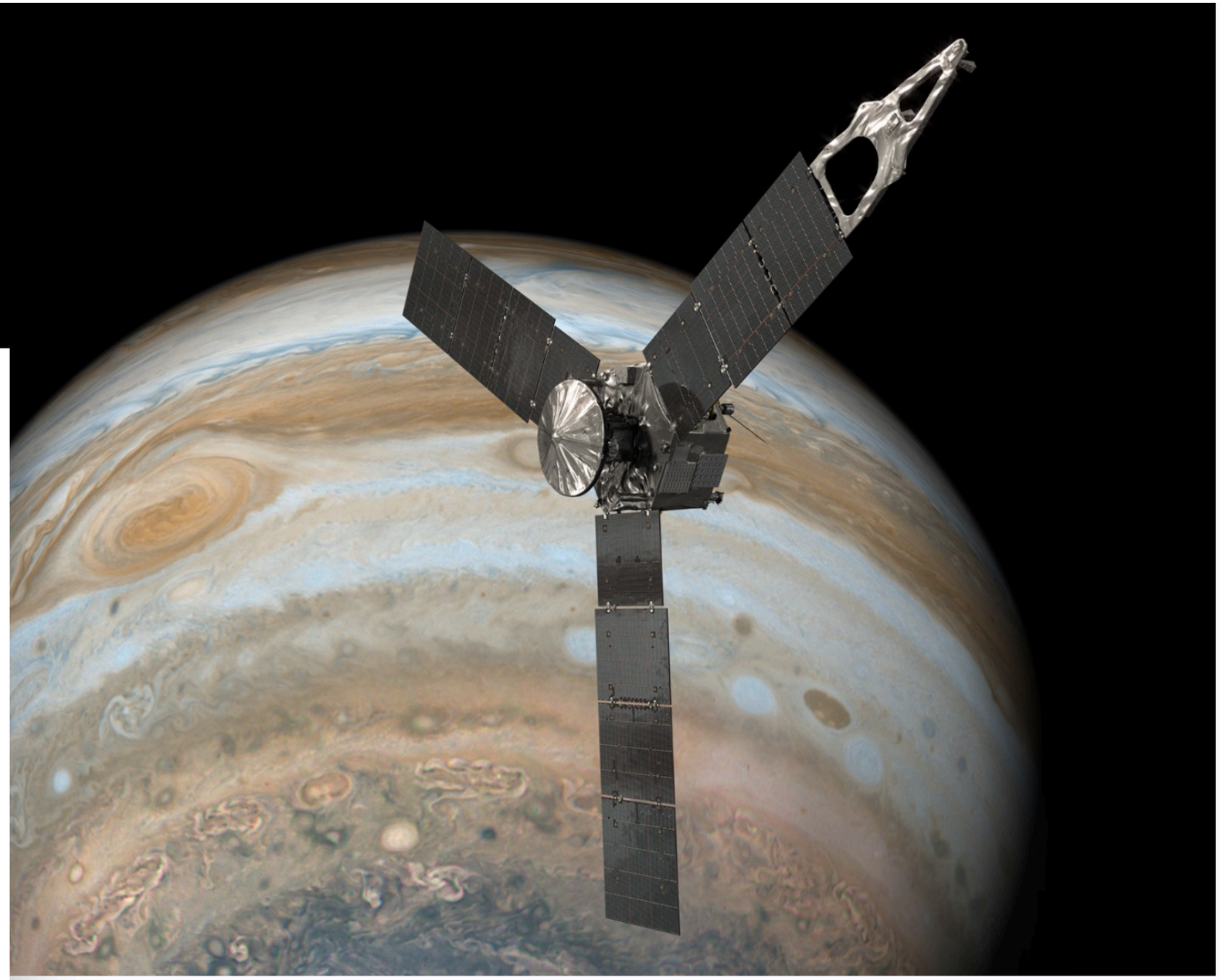
Sep. 2023

SPAT0055 - SPAT0048

Space Sciences Aerospace engineering

SPAT0048-4	Earth's atmospheric and space environment	
	SPAT0048-C-a	Introduction to atmospheric physics, 37h Th
	SPAT0048-B-a	Space environment, 15h Th
SPAT0048-5	Earth's atmospheric and space environment	
	SPAT0048-B-a	Space environment, 15h Th
	SPAT0048-A-d	Applied space environment, 15h Pr

~~SPAT0029~~
Nov 2023

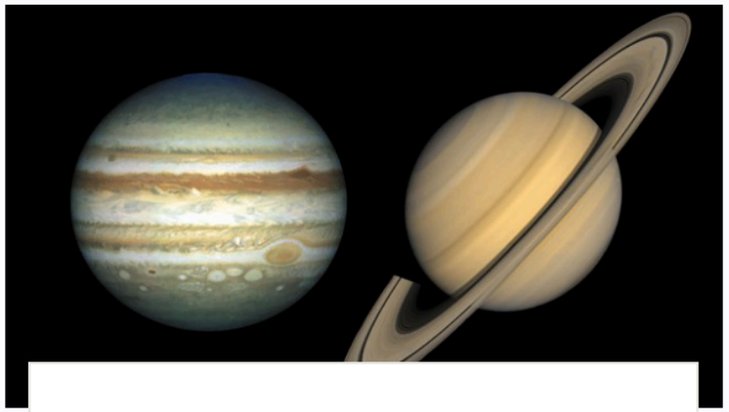


Laboratory for Planetary and Atmospheric Physics

LPAP is organized into four research themes focusing on different aspects of planetary atmospheres and their interactions with the magnetospheres and oceans.

LEARN MORE

Atmosphere of the Earth – Denis Grodent



Atmosphères et magnetosphères des planètes géantes

Les planètes ne sont pas que des grosses sphères de roche, de glace ou de gaz. Leur zone d'influence se prolonge bien au-delà de leur haute atmosphère, à travers leur attraction gravifique et leur champ magnétique.

LEARN MORE

Earth Magnetosphere and Upper atmosphere

When an atom or a molecule collides with another particle, it can gain internal energy which will be lost by the emission of light.

LEARN MORE

Atmospheres of Venus and Mars

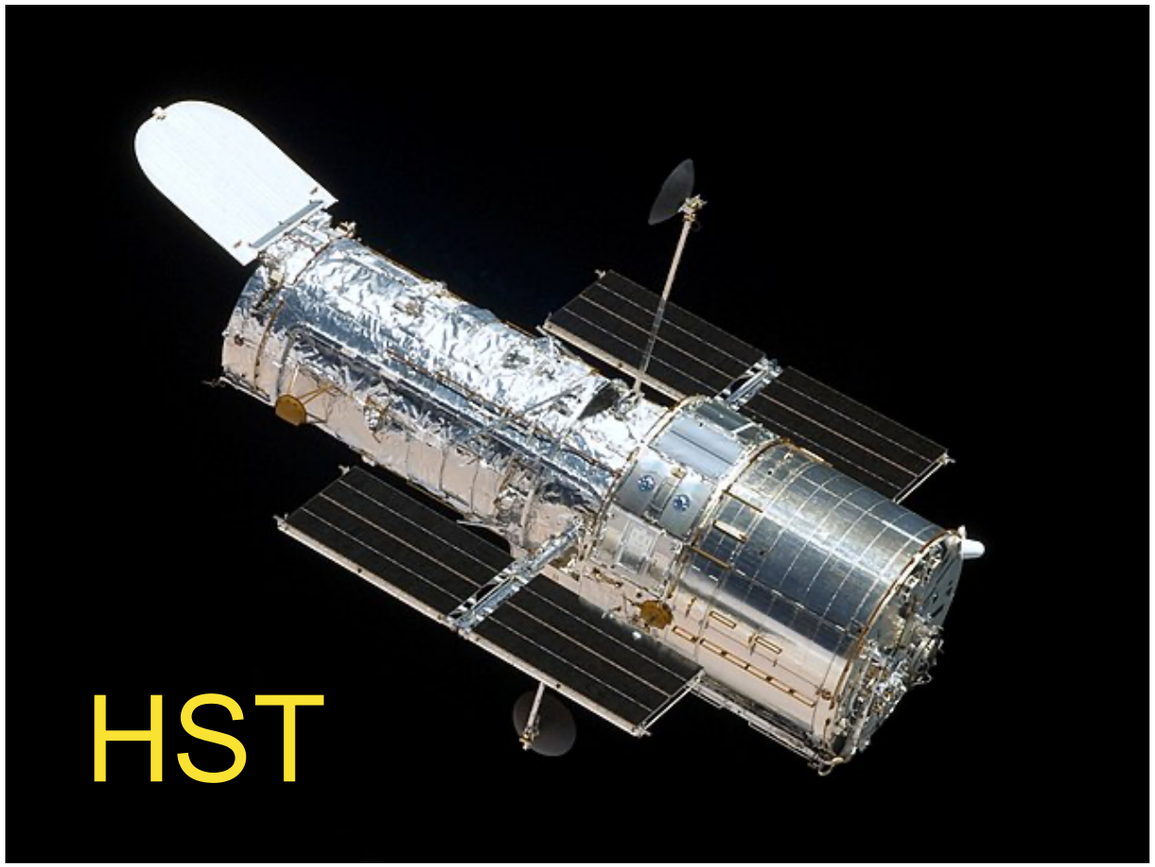
The terrestrial planets possess several common characteristics (e.g. their mass, diameter, density or their distance to the sun), but they also differ in many respects.

LEARN MORE

Earth atmosphere and carbon cycle

Biogeochemical cycles play an important role in the evolution of Earth's climate. This especially holds for the carbon cycle.

Juno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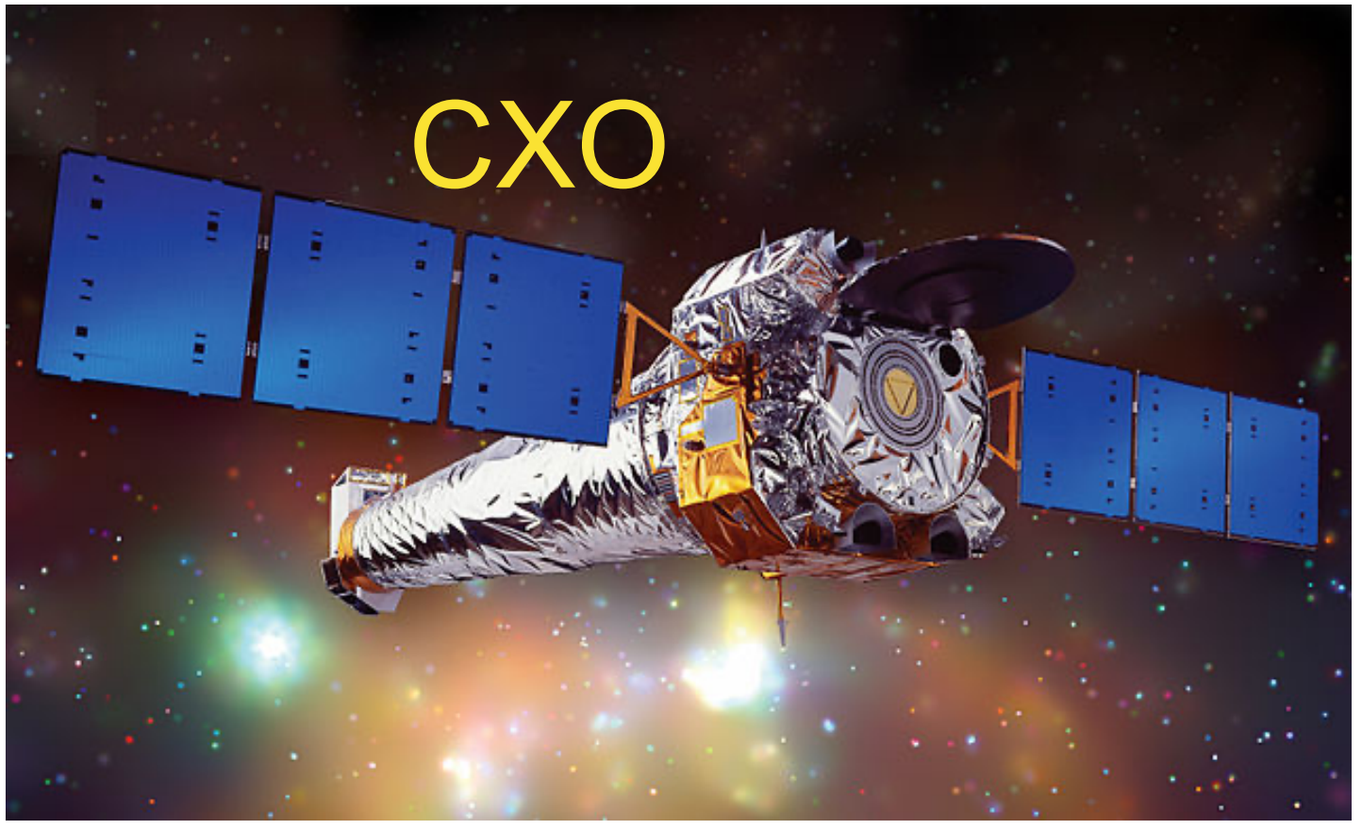
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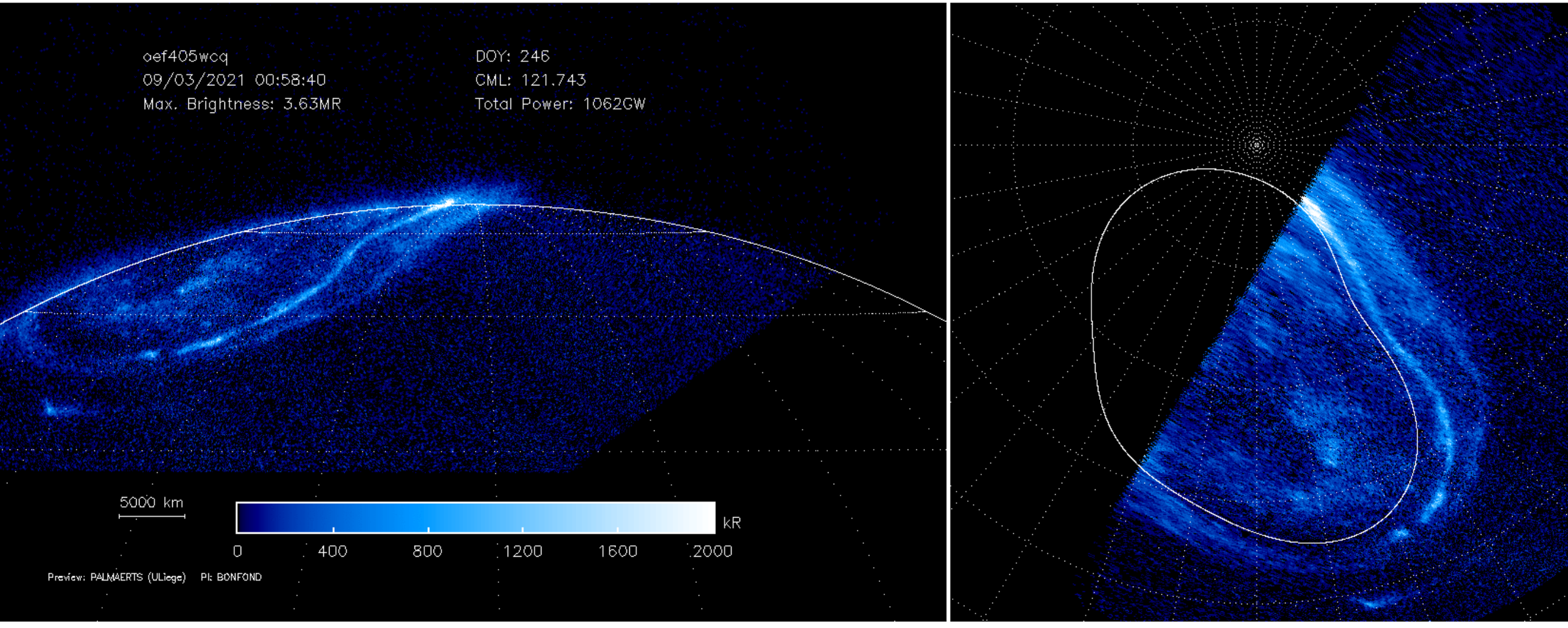
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AERO0018-3	Space experiment development	
	AERO0018-A-c	26h Th, 26h Pr
SPAT0028-2	Planetary magnetospheres and aurorae	
	SPAT0028-A-b	20h Th, 10h Pr
SPAT0048-4	Earth's atmospheric and space environment	
	SPAT0048-C-a	Introduction to atmospheric physics, 37h Th
	SPAT0048-B-a	Space environment, 15h Th
SPAT0048-5	Earth's atmospheric and space environment	
	SPAT0048-B-a	Space environment, 15h Th
	SPAT0048-A-d	Applied space environment, 15h Pr
SPAT0055-1	Atmosphere of the Earth	
	SPAT0055-A-a	45h Th
SPAT0056-1	Planetary and exoplanetary atmospheres	
	SPAT0056-A-a	30h Th, 15h Pr

~ 240 hr

2019-2020 Face-to-face lectures only

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SPAT0048_0055_structure1

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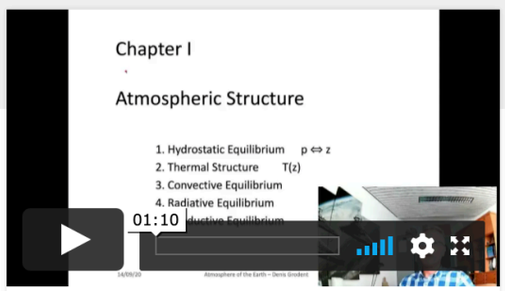

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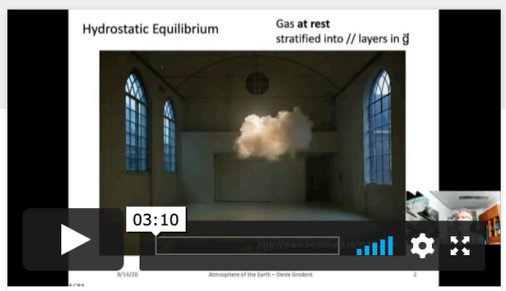
Denis Grodent



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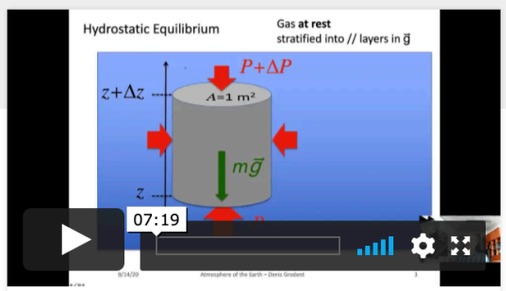

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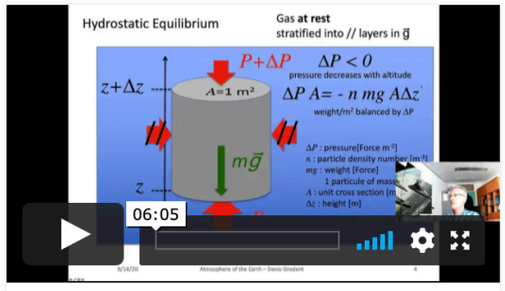

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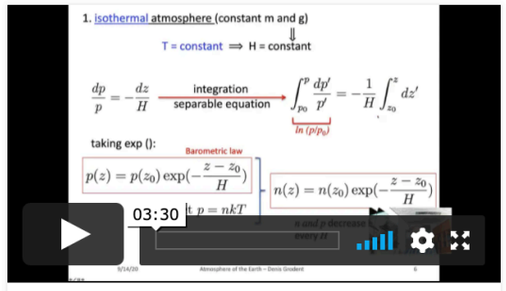

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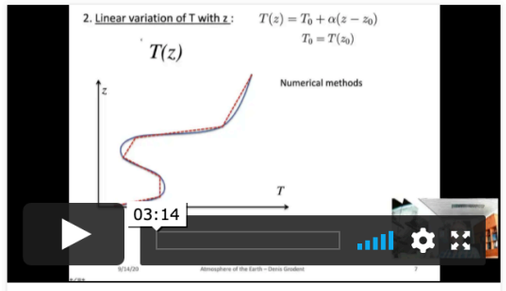

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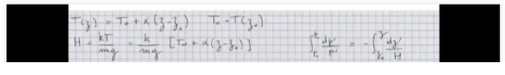

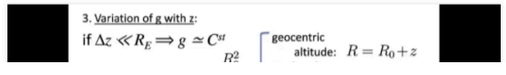

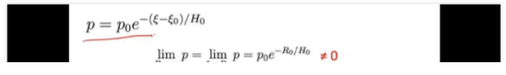

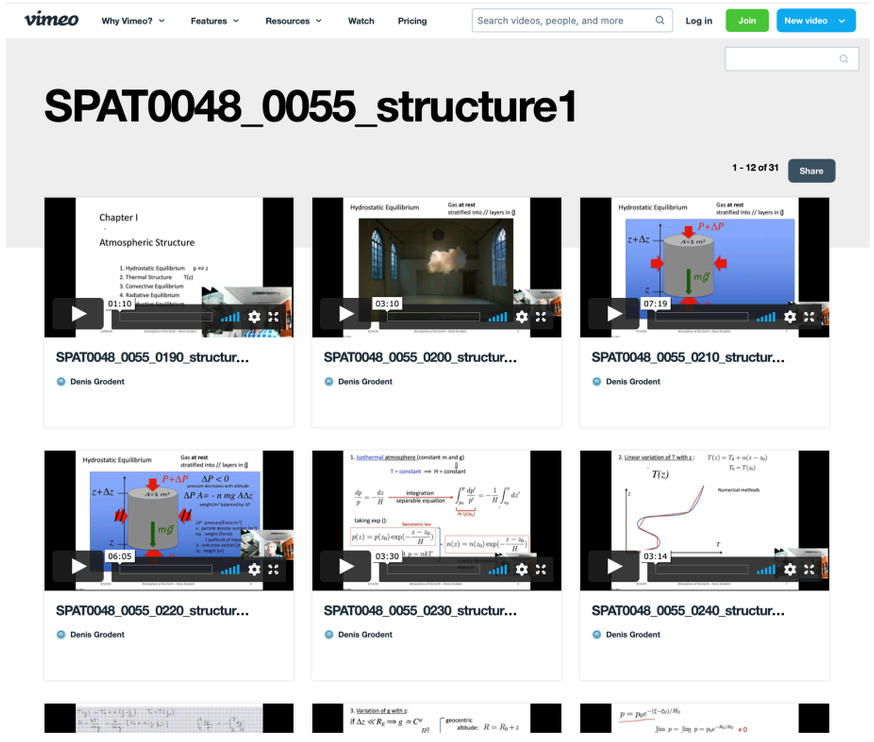

https://vimeo.com/showcase/8808014

passwd: SPAT00480055

Links sent by email,

also available on **eCampus**

Course # *Subject* *low resolution*

SPAT0048_0055_0260_structure_slide_12_13_low.mp4

reference number of the video xxxx

corresponding PDF slide(s)

All presented slides (+additional material) are available on eCampus

Tentative Schedule

Week 1 INT Introduction, the martian

Week 2 EXT, ATM1 Extreme events, Atmospheric structure

Week 3 ATM2, ISA Atmospheric structure

Week 4 SUN1, SUN2 Sun-Earth interactions

Week 5 RT1 RT2 Radiative Transfer 1, 2

Week 6 RT3 Radiative Transfer 3 (06b, 06Buglia)

Week 7 RT4, RT5 Radiative Transfer 4, 5

Week 8 RT6, PH1 Radiative Transfer 6 Photochemistry 1

Week 9 PH2, PH3, PH4 Photochemistry 2, 3, 4

Week 10 TRA0, TRA1, TRA2 Transport 0, 1, 2

Week 11 ION1, ION2 Ionosphere 1, 2

Space Environment

Week 12 SE1 Introduction-Solar wind

Week 13 SE2 B field - Magnetosphere

Week 14 SE3 Particles - Storms

introduction 0-60

https://vimeo.com/showcase/8807803

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the martian 70-110

https://vimeo.com/showcase/8807858

extreme events 120-180

https://vimeo.com/showcase/8807867

atmospheric structure 190-720

https://vimeo.com/showcase/8808014

https://vimeo.com/showcase/8809878

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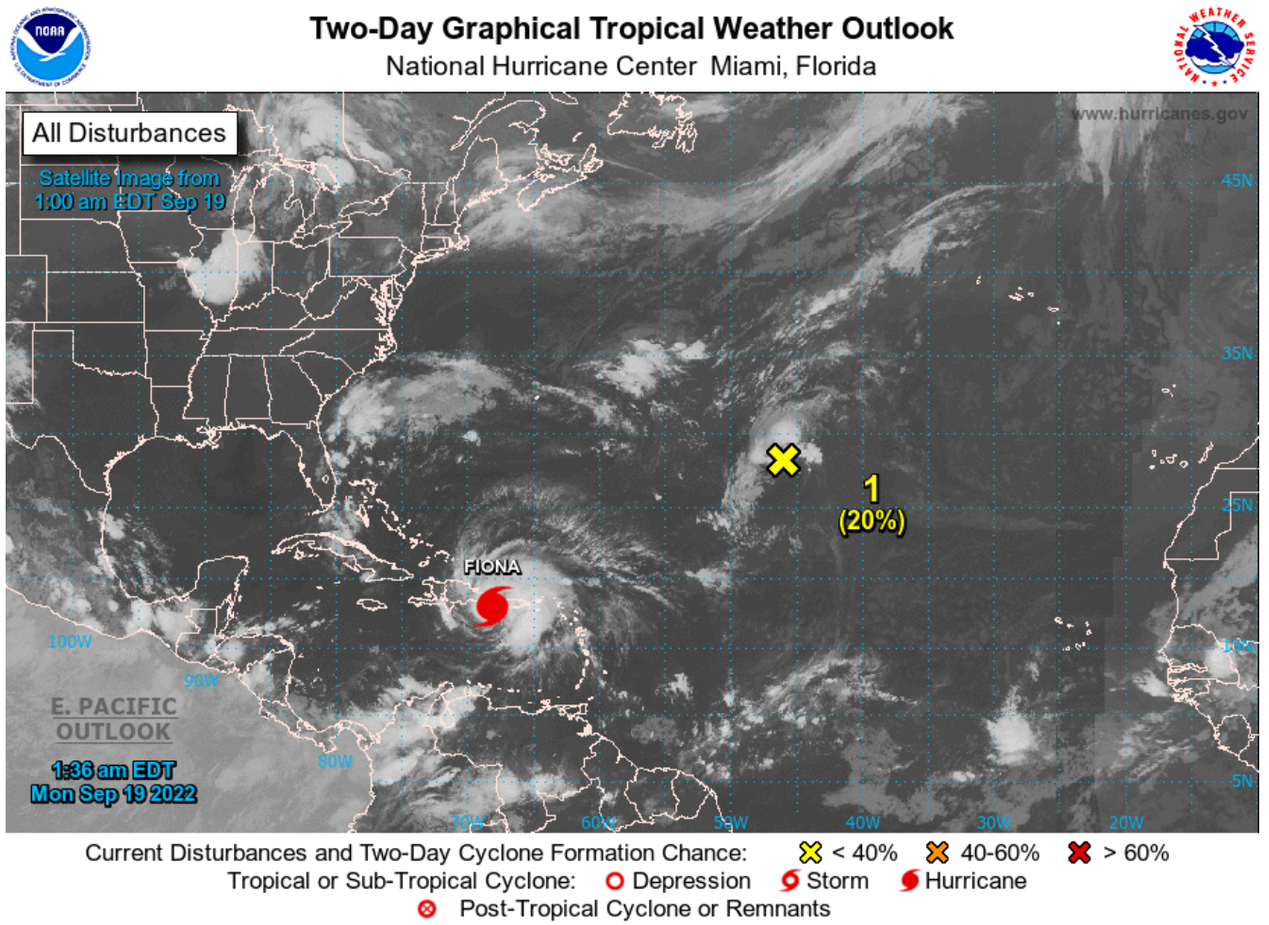
Updates

Extreme Events

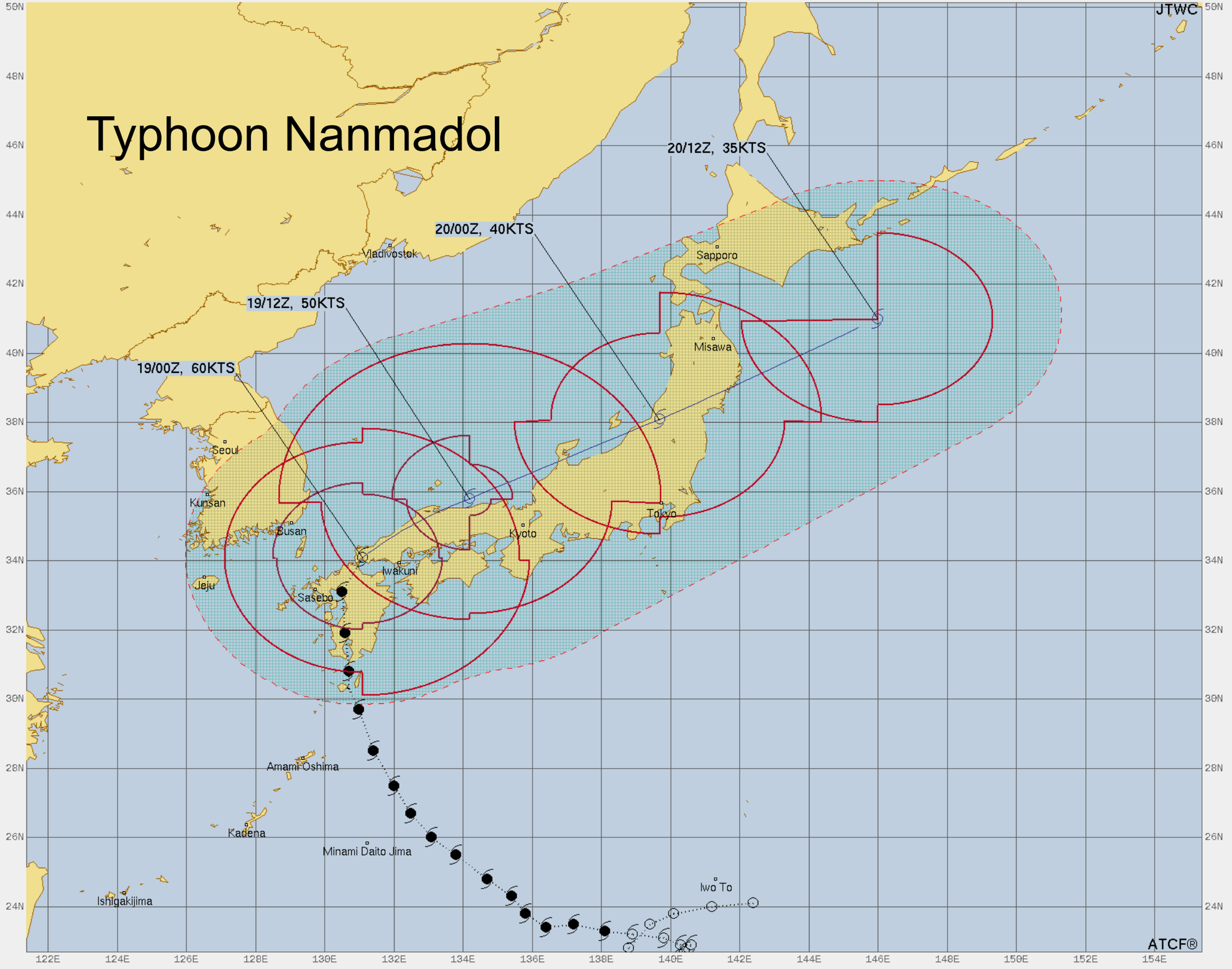
National Hurricane Center

https://www.nhc.noaa.gov



Joint Typhoon Warning Center

https://www.metoc.navy.mil/jtwc/jtwc.html



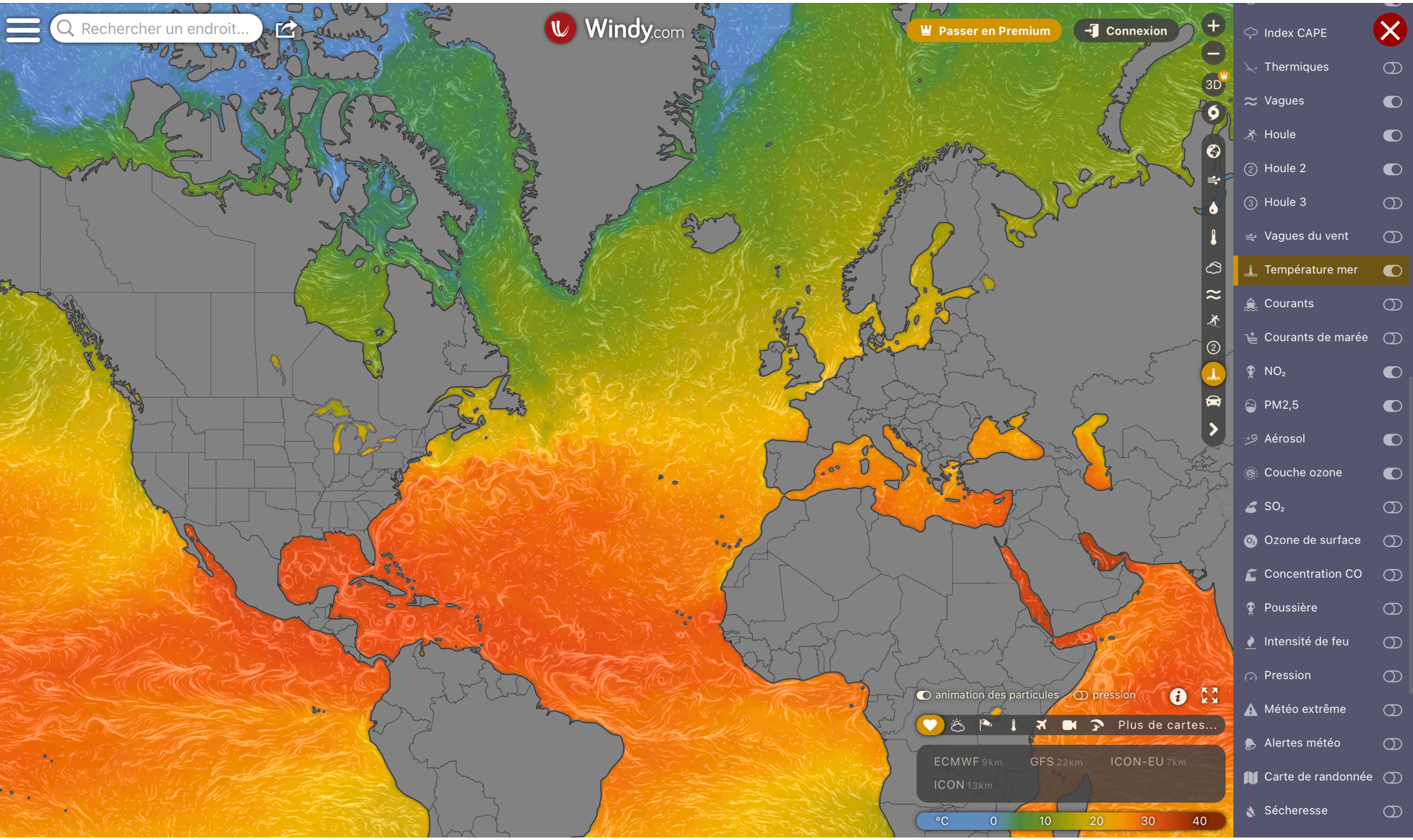
TROPICAL STORM 16W (NANMADOL) WARNING #26
WTPN33 PGTW 190300
190000Z POSIT: NEAR 34.1N 131.1E
MOVING 025 DEGREES TRUE AT 11 KNOTS
MAXIMUM SIGNIFICANT WAVE HEIGHT: 28 FEET
19/00Z, WINDS 060 KTS, GUSTS TO 075 KTS
19/12Z, WINDS 050 KTS, GUSTS TO 065 KTS
20/00Z, WINDS 040 KTS, GUSTS TO 050 KTS
20/12Z, WINDS 035 KTS, GUSTS TO 045 KTS

CPA TO:	NM	DTG
IWAKUNI	28	09/19/03Z
R2S2	24	09/19/14Z
CAMP_FUJI	132	09/19/20Z
ATSUGI	132	09/19/21Z
CAMP_ZAMA	132	09/19/21Z
YOKOSUKA	149	09/19/21Z
YOKOTA_AB	119	09/19/21Z
NARITA_AIRPORT	138	09/19/23Z
SHARIKI	137	09/20/04Z
MISAWA	96	09/20/05Z

BEARING AND DISTANCE	DIR	DIST (NM)	TAU (HRS)
CAMP_FUJI	262	391	0
CHINHAE	118	136	0
GWANGYANG	105	175	0
INCHON	132	299	0
IWAKUNI	270	55	0
KUNSAN_AB	115	246	0
MOKPO	099	236	0
OSAN_AB	131	269	0
PUSAN	121	116	0
SASEBO	052	88	0
YEOSU	103	173	0
YONGSAN_AIN	134	285	0
CAMP_RED_CLOUD	137	298	0
CAMP_HUMPHREYS	130	265	0
TAEGU	132	160	0
R2S2	244	226	0
SEOUL_AB	134	278	0
POHANG	143	141	0
GIMHAE_AB	121	127	0
GWANGJU_AB	105	221	0
SUWON_AB	132	273	0
CHEONGJU_AB	130	235	0
CAMP_CASEY	138	299	0
CAMP_KENGUN	007	79	0
KANOYA	004	162	0

LESS THAN 34 KNOTS
34-63 KNOTS
MORE THAN 63 KNOTS
FORECAST CYCLONE TRACK
PAST CYCLONE TRACK
DENOTES 34 KNOT WIND DANGER AREA/USN SHIP AVOIDANCE AREA
FORECAST 34/50/64 KNOT WIND RADII (WINDS VALID OVER OPEN OCEAN ONLY)

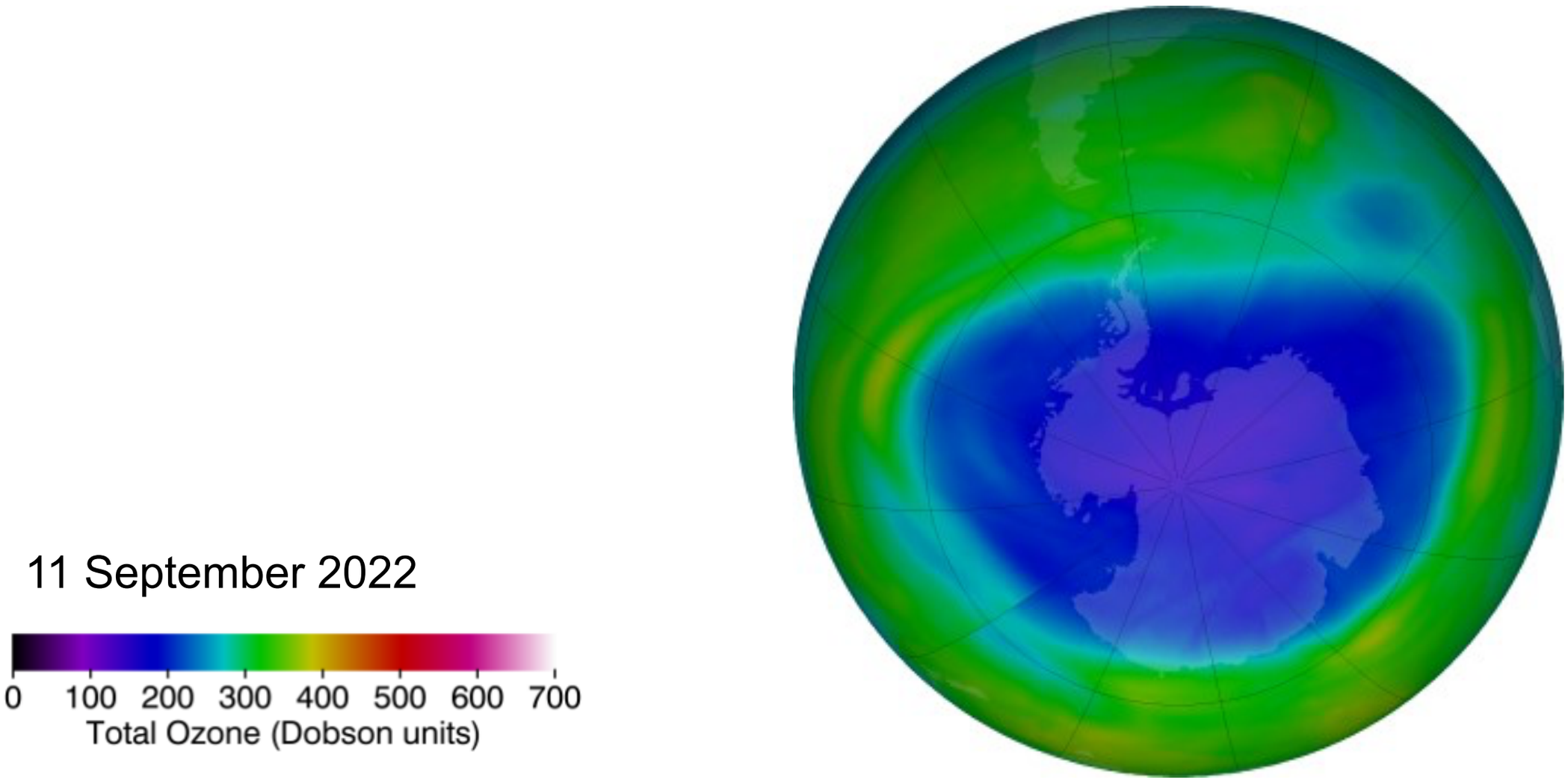
https://www.windy.com/



Ozone Hole

NASA Ozone Watch

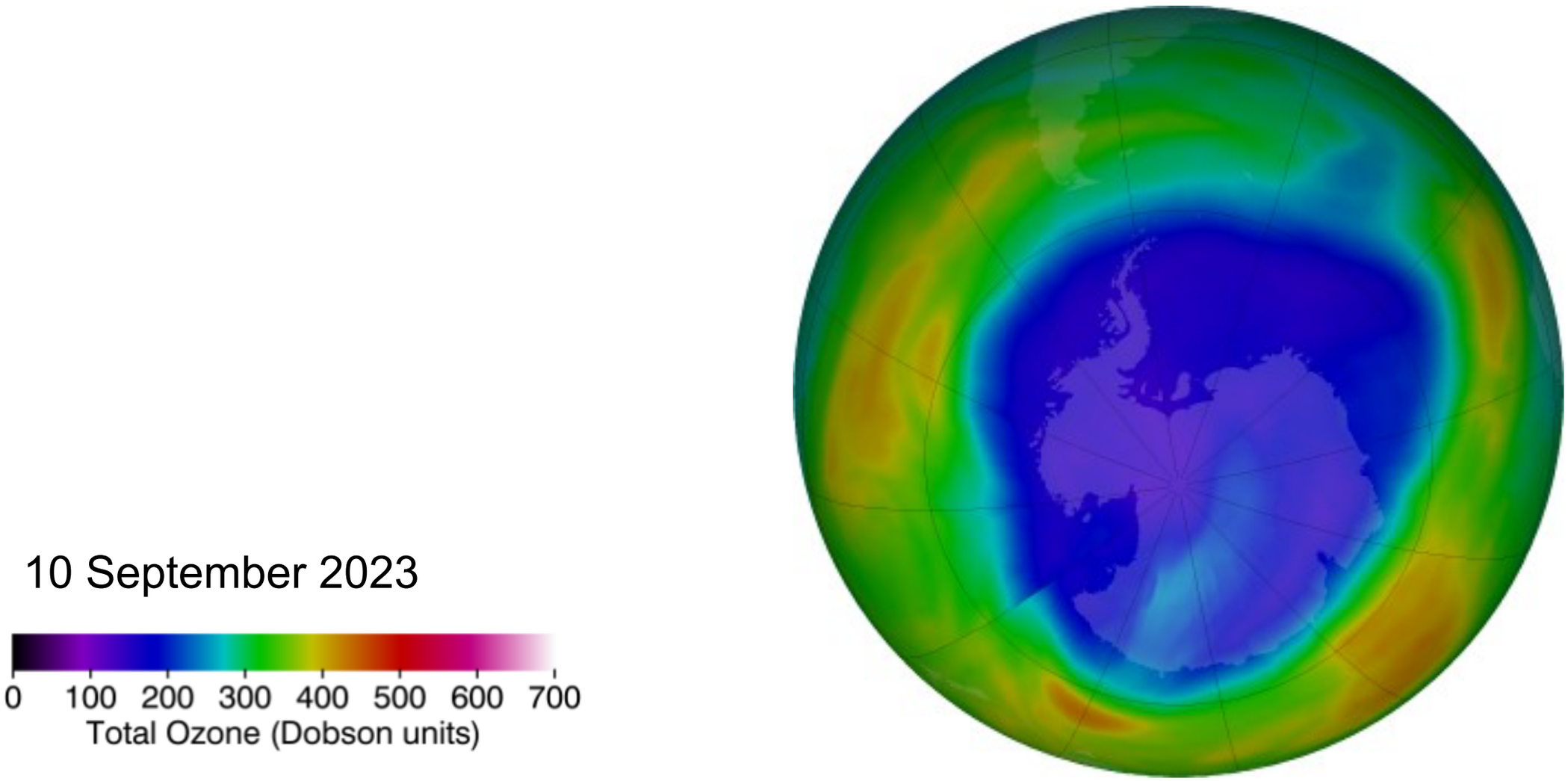
https://ozonewatch.gsfc.nasa.gov



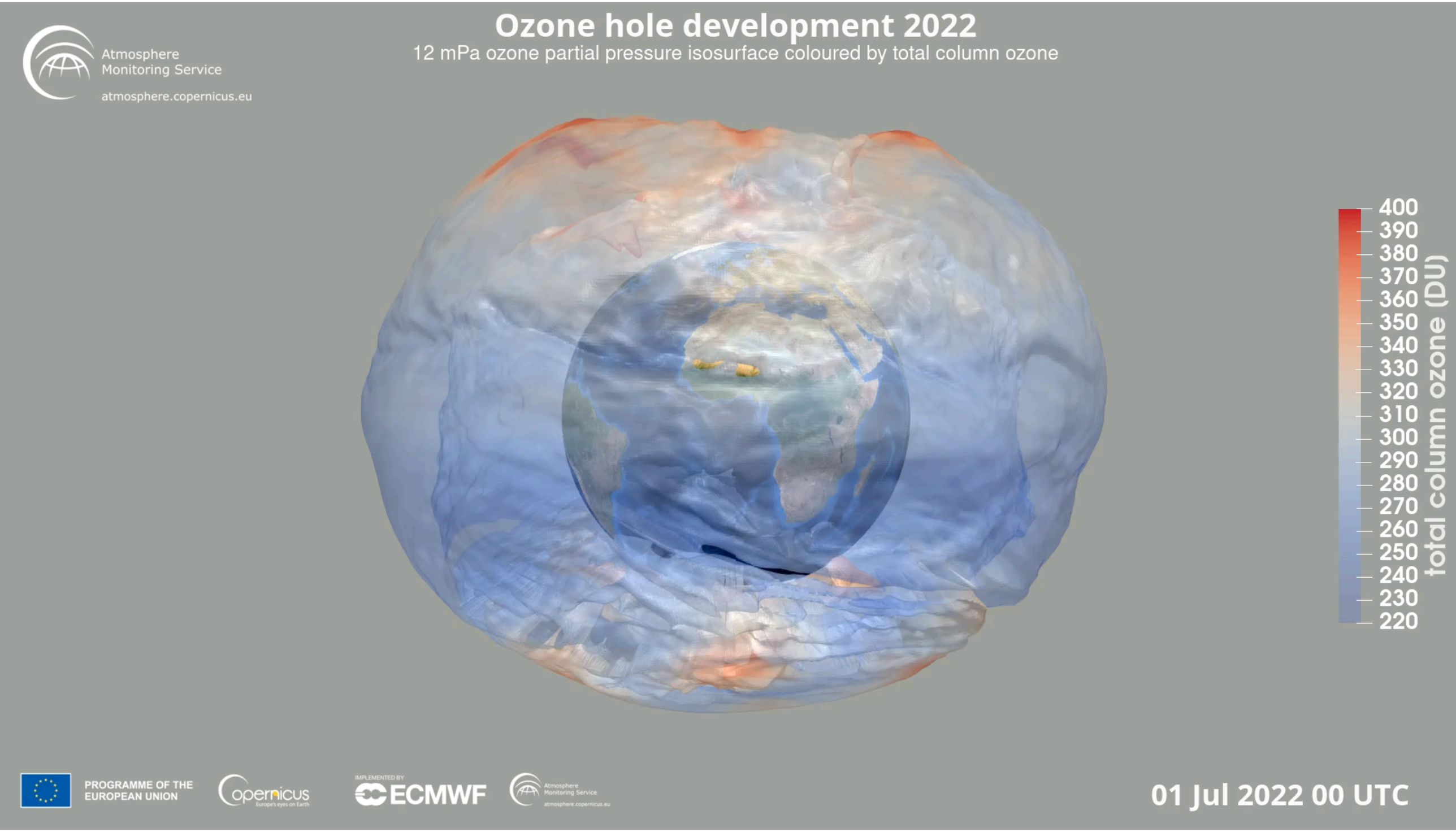
Ozone Hole

NASA Ozone Watch

https://ozonewatch.gsfc.nasa.gov



Ozone Hole


Ozone hole development 2022
12 mPa ozone partial pressure isosurface coloured by total column ozone
Atmosphere Monitoring Service
atmosphere.copernicus.eu
400
390
380
370
360
350
340
330
320
310
300
290
280
270
260
250
240
230
220
total column ozone (DU)
PROGRAMME OF THE EUROPEAN UNION
IMPLEMENTED BY ECMWF
01 Jul 2022 00 UTC