

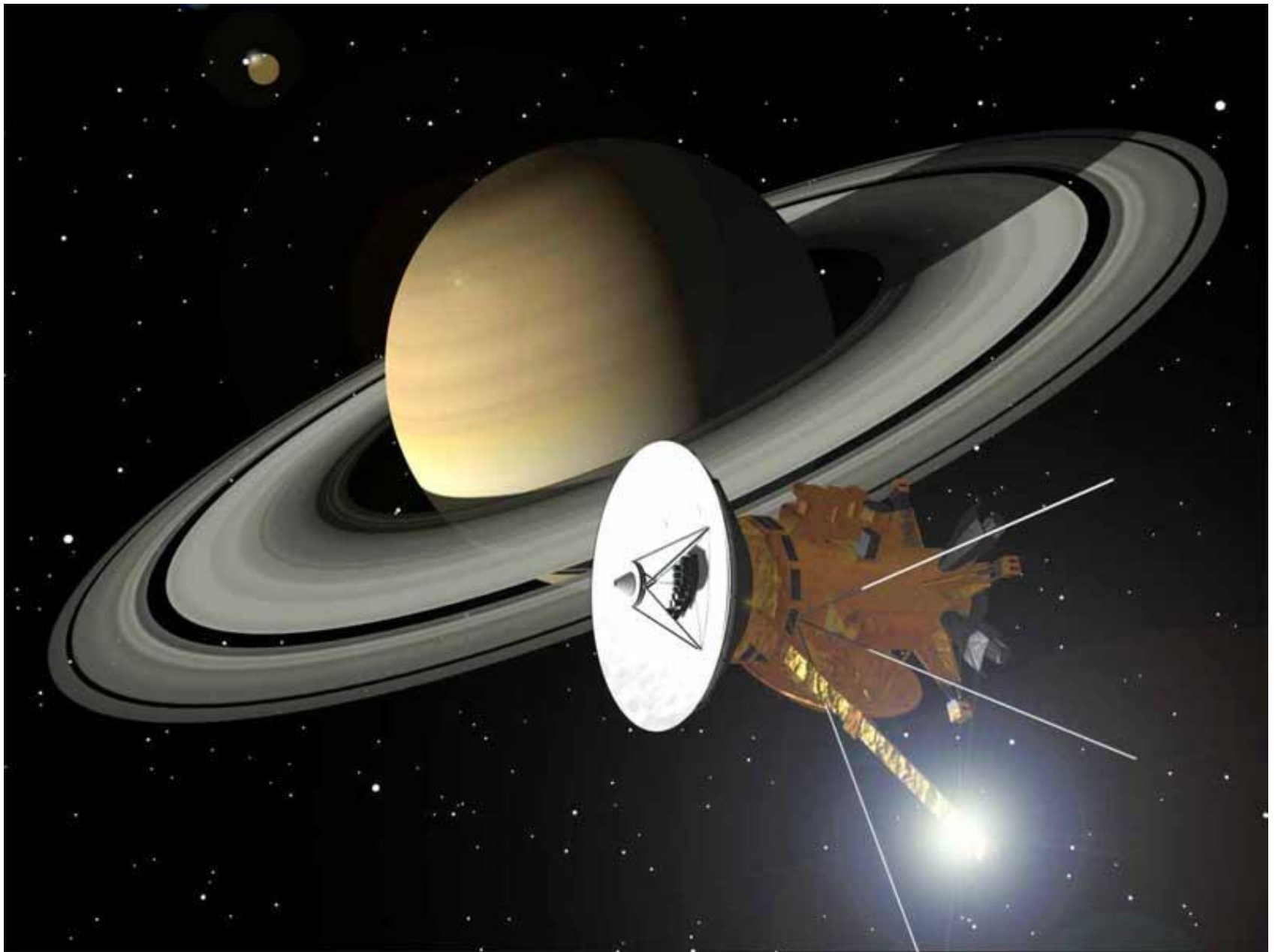


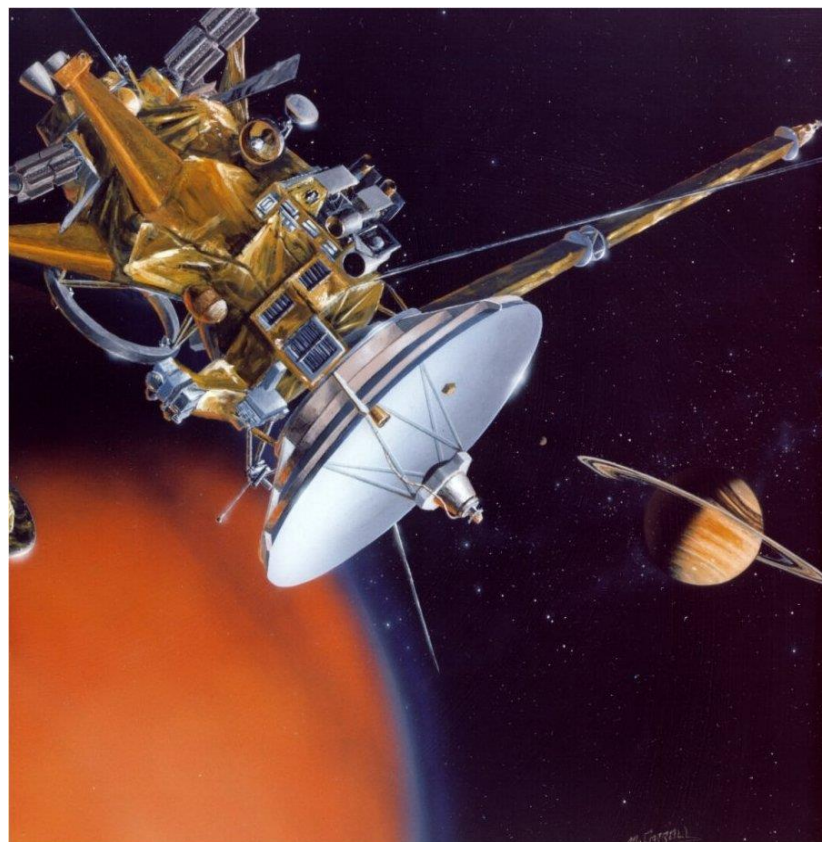
ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
Εθνικόν και Καποδιστριακόν
Πανεπιστήμιον Αθηνών

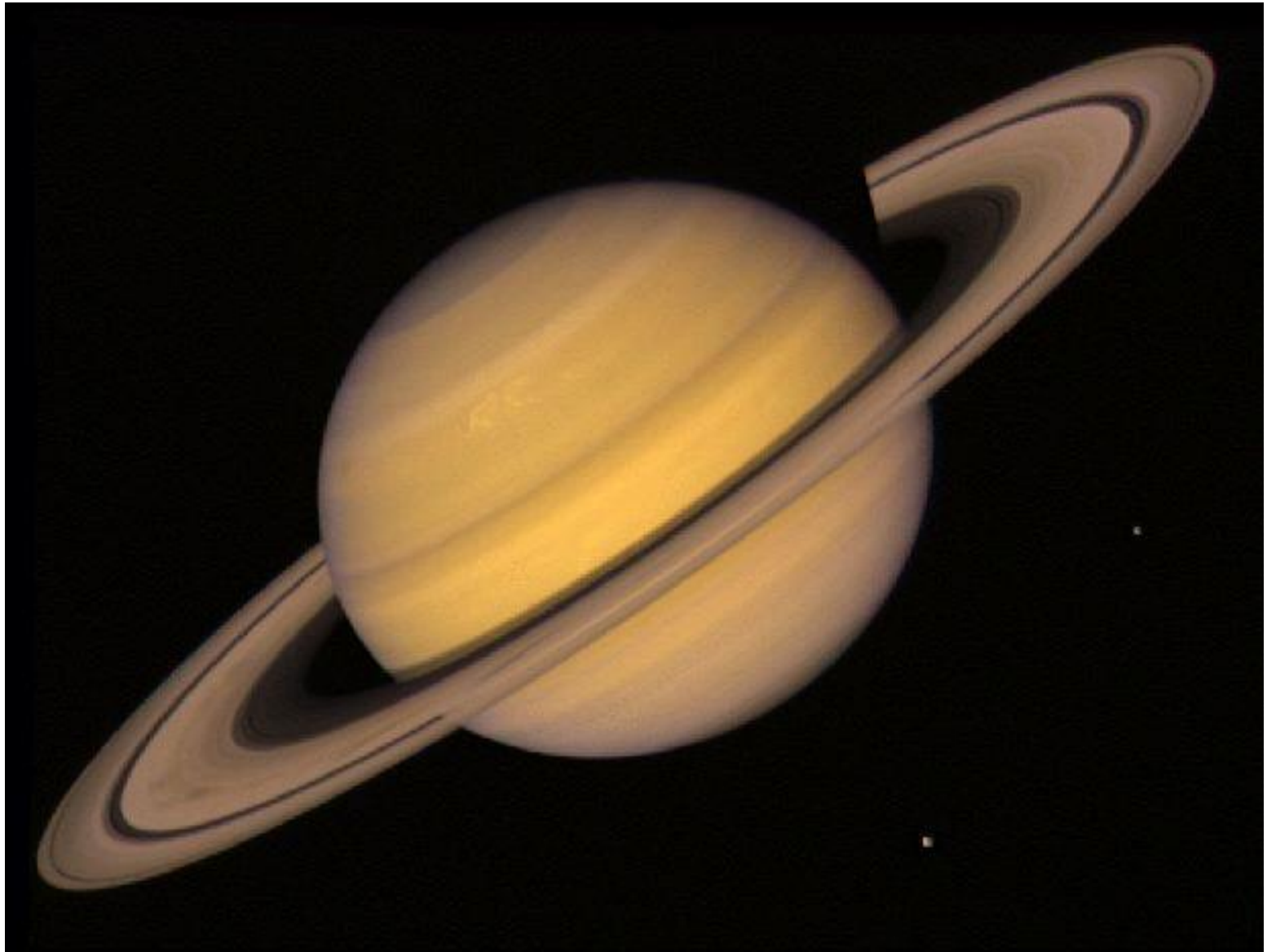
Εισαγωγή στην Αστροφυσική

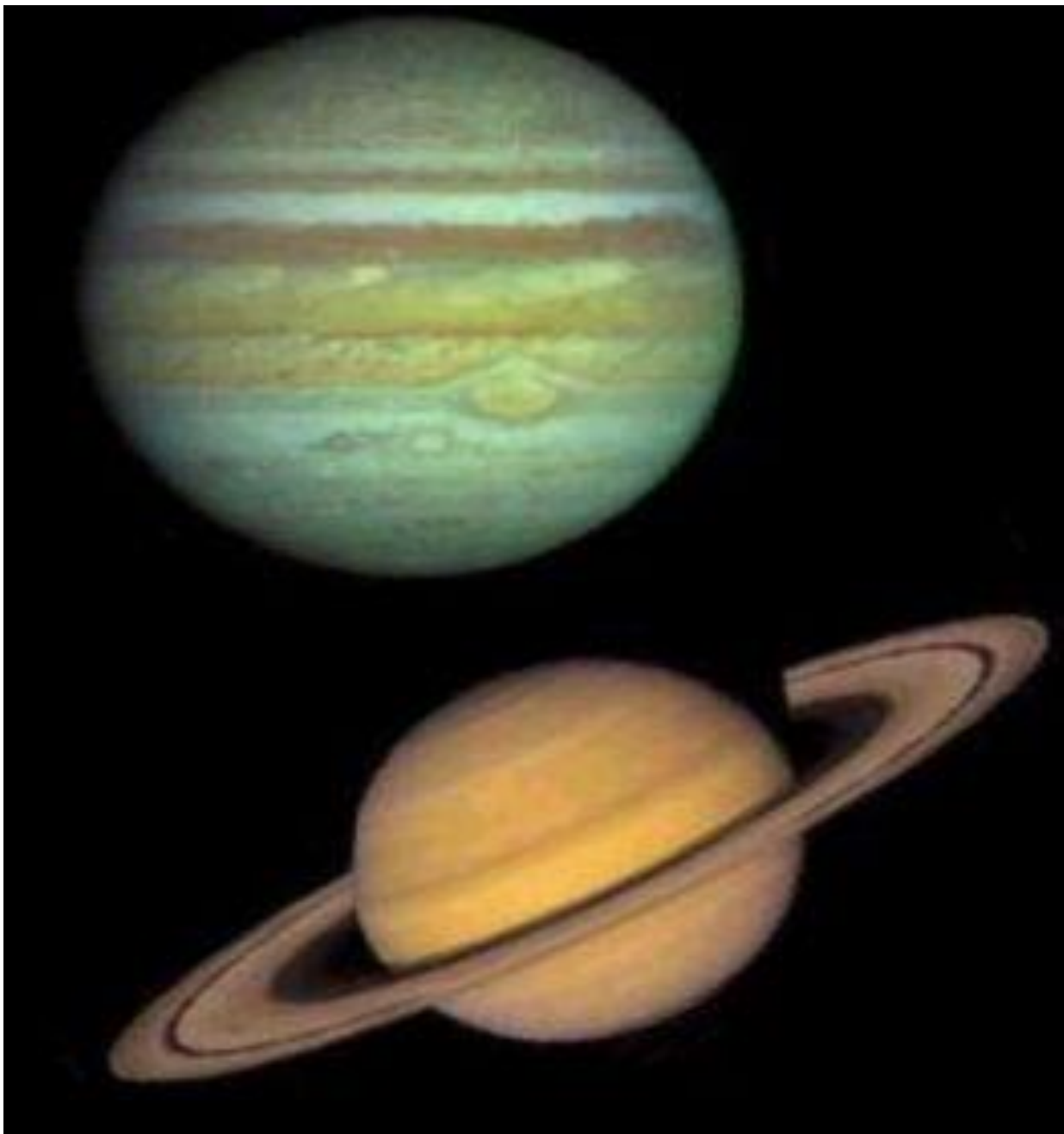
Ενότητα 4: Πλανητικό σύστημα

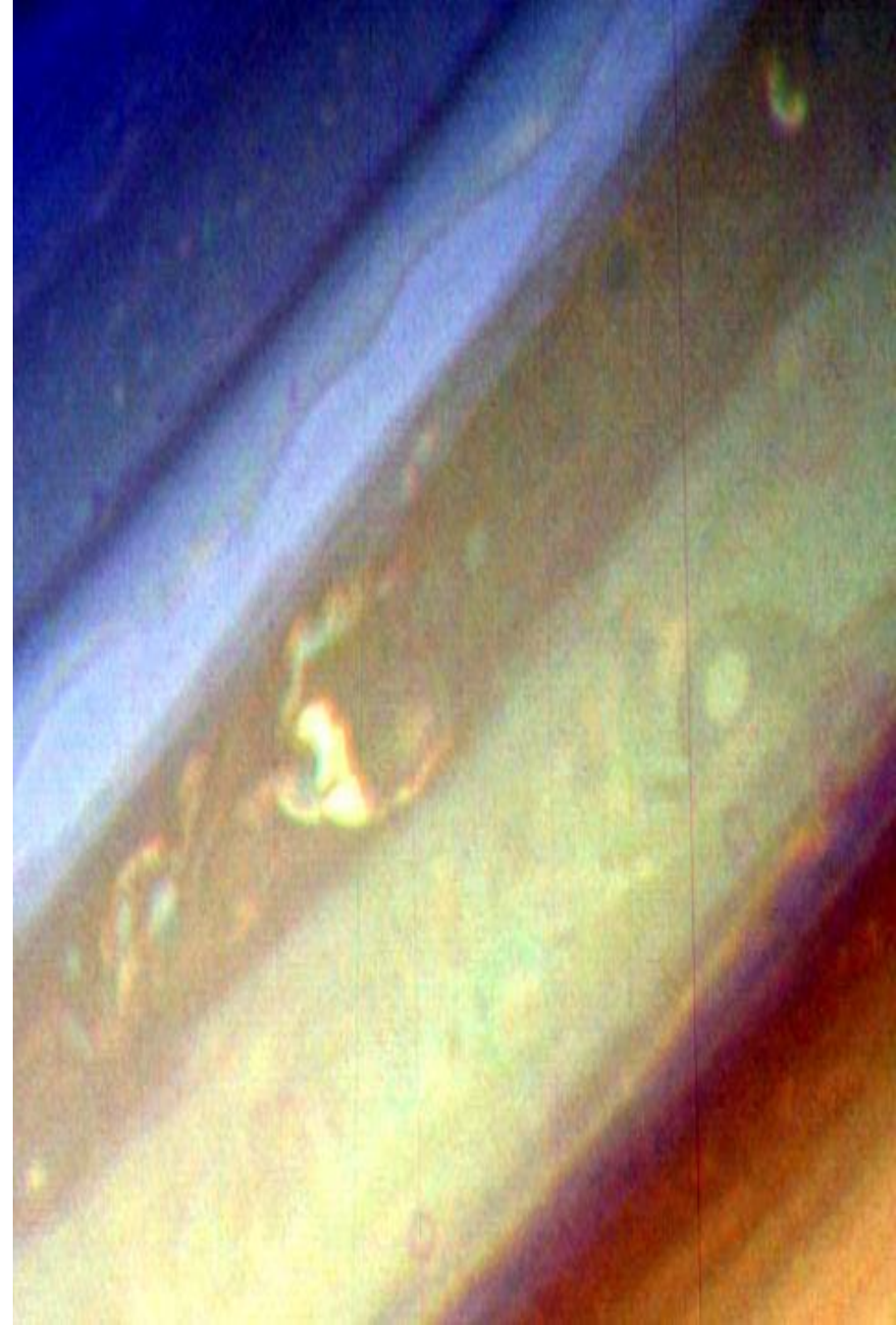
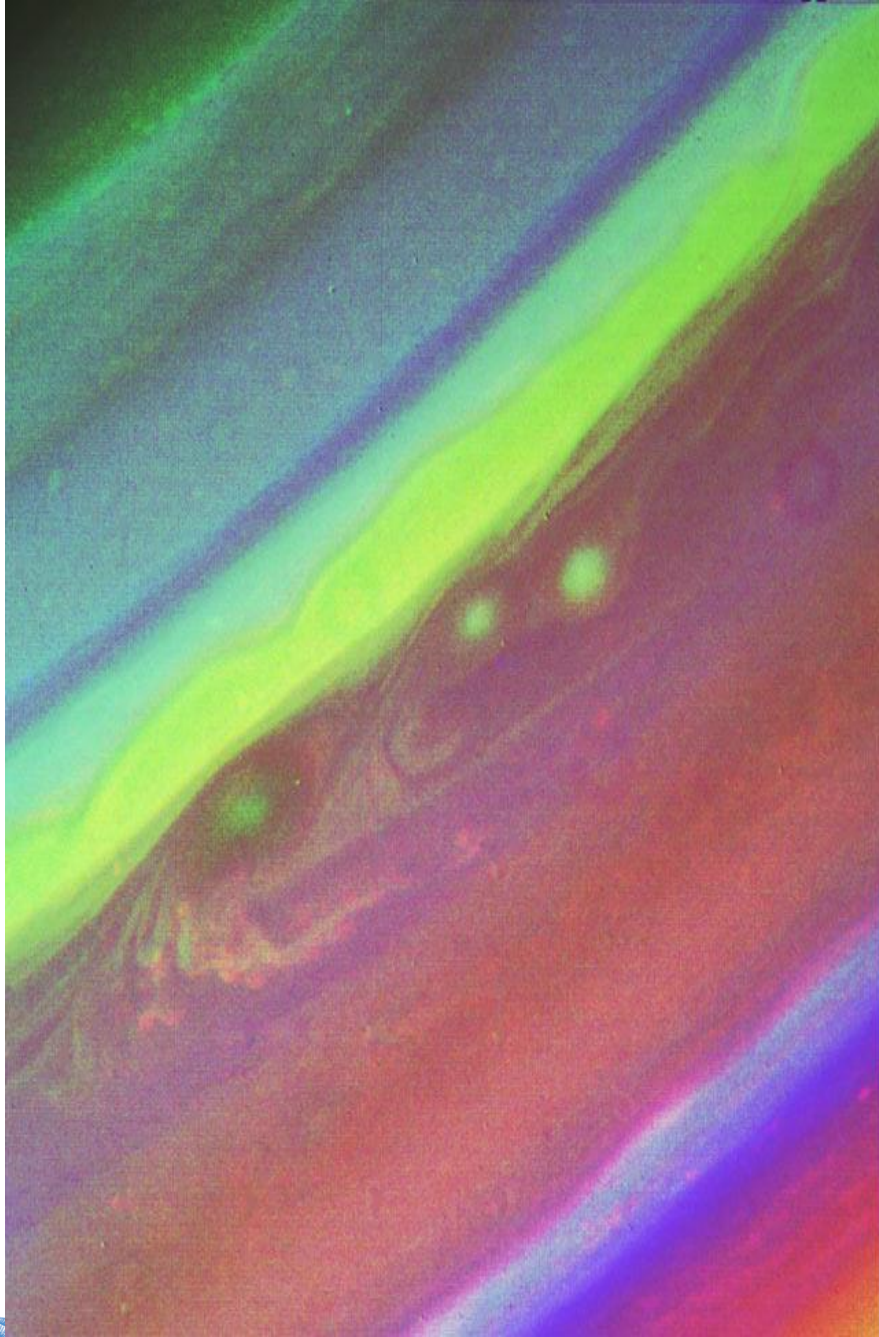
Παναγιώτα Πρέκα
Σχολή Θετικών Επιστημών
Τμήμα Φυσικής

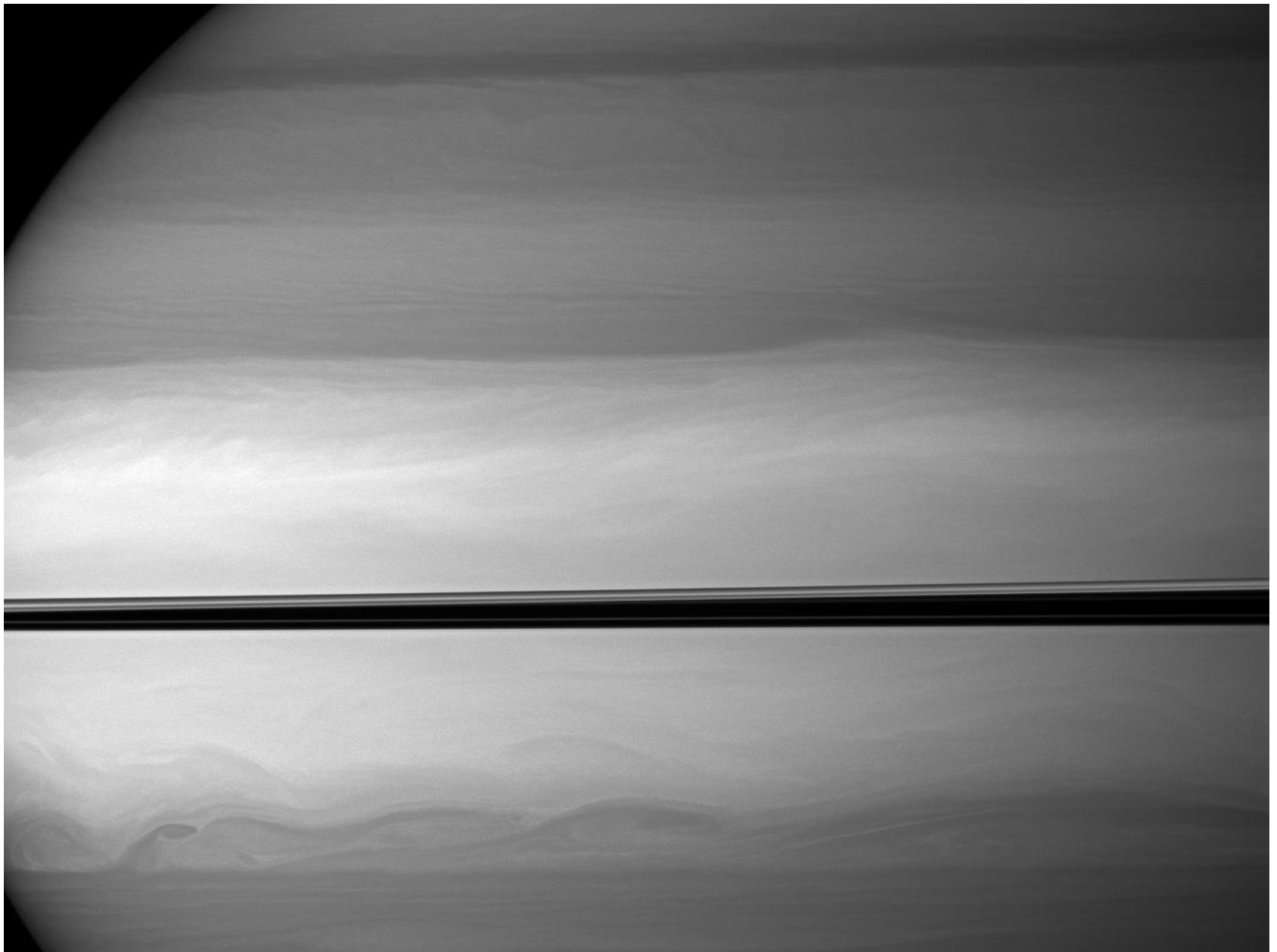


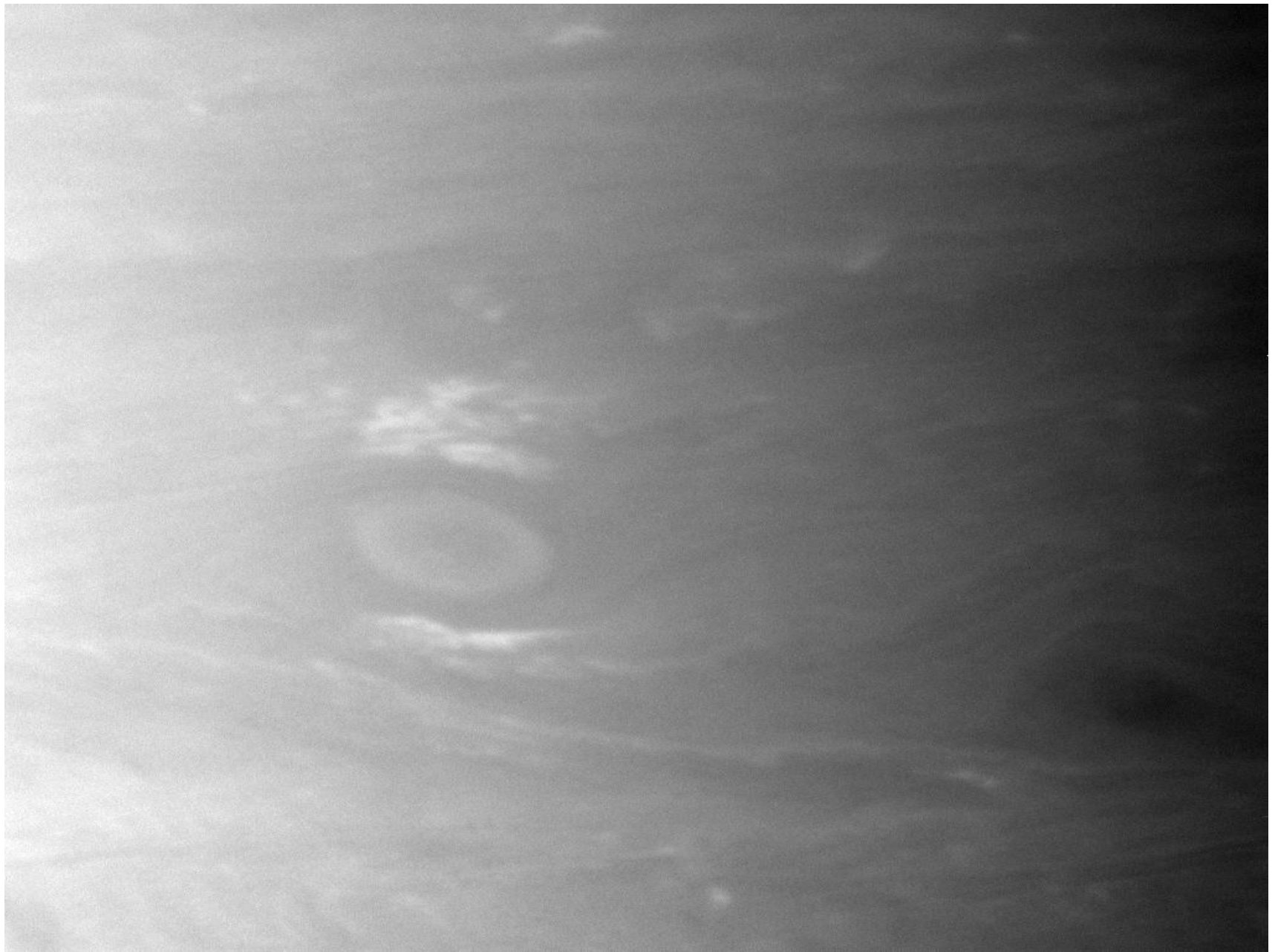


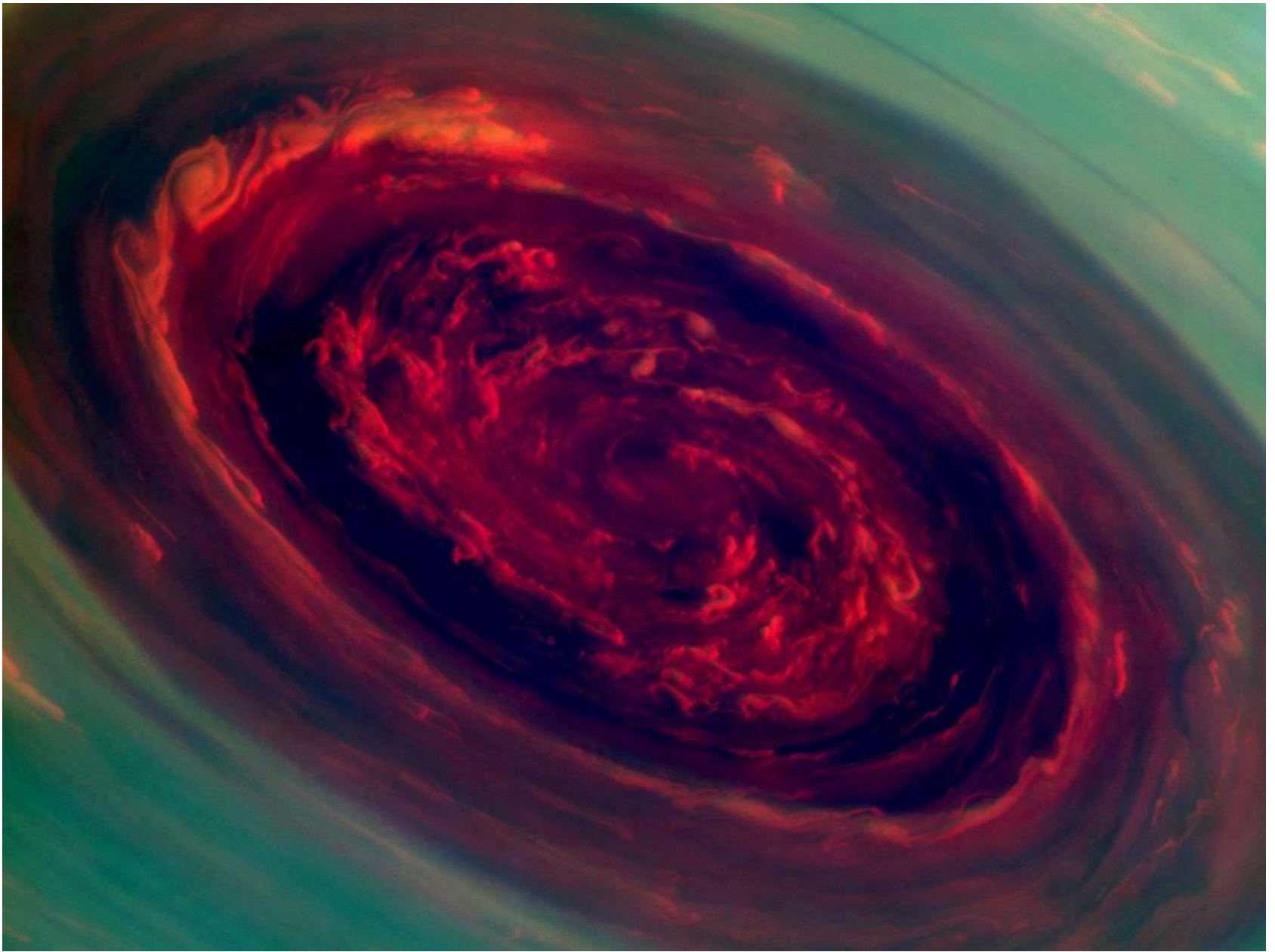




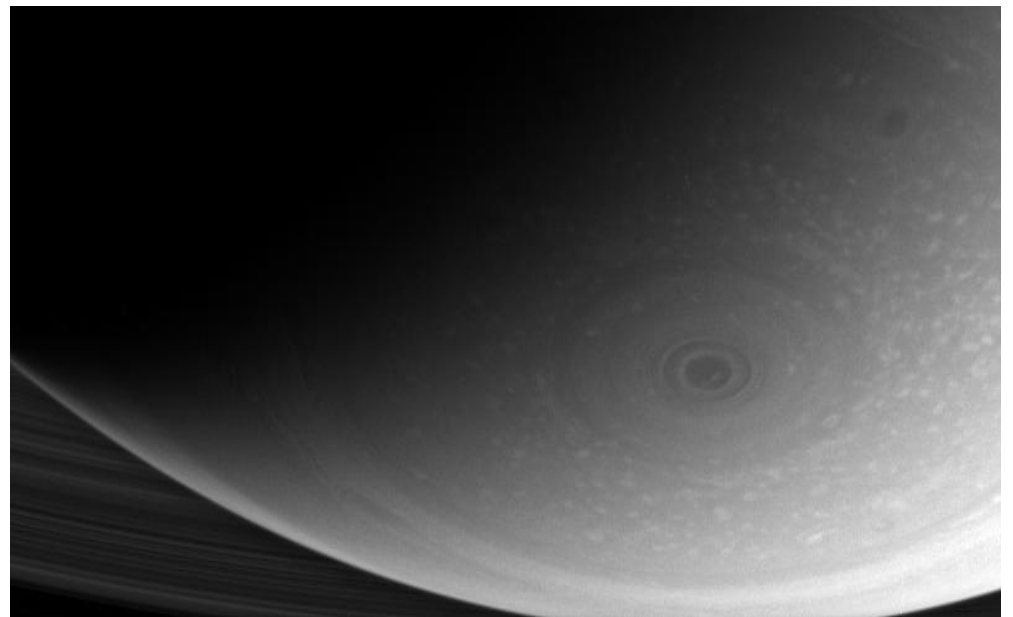
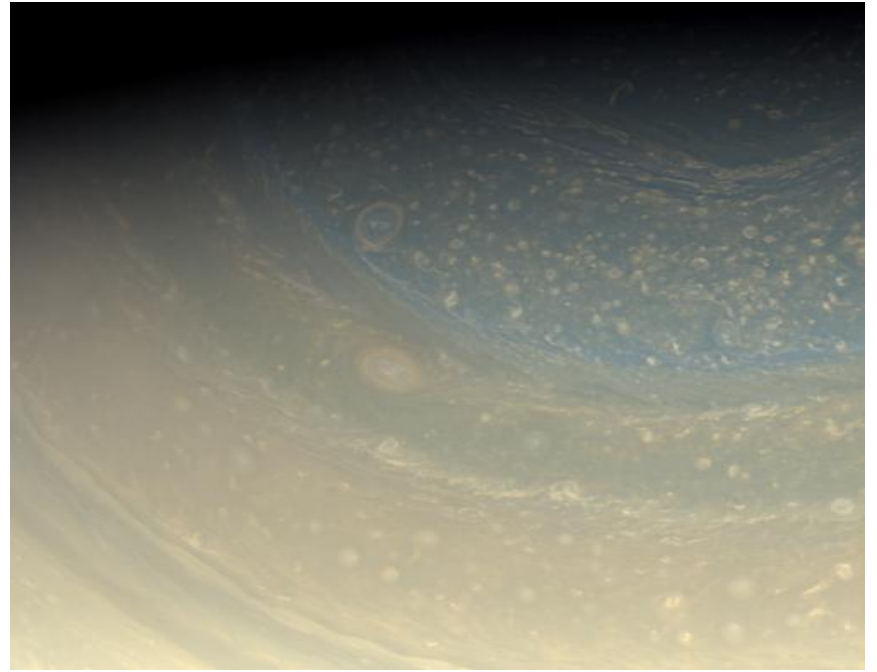


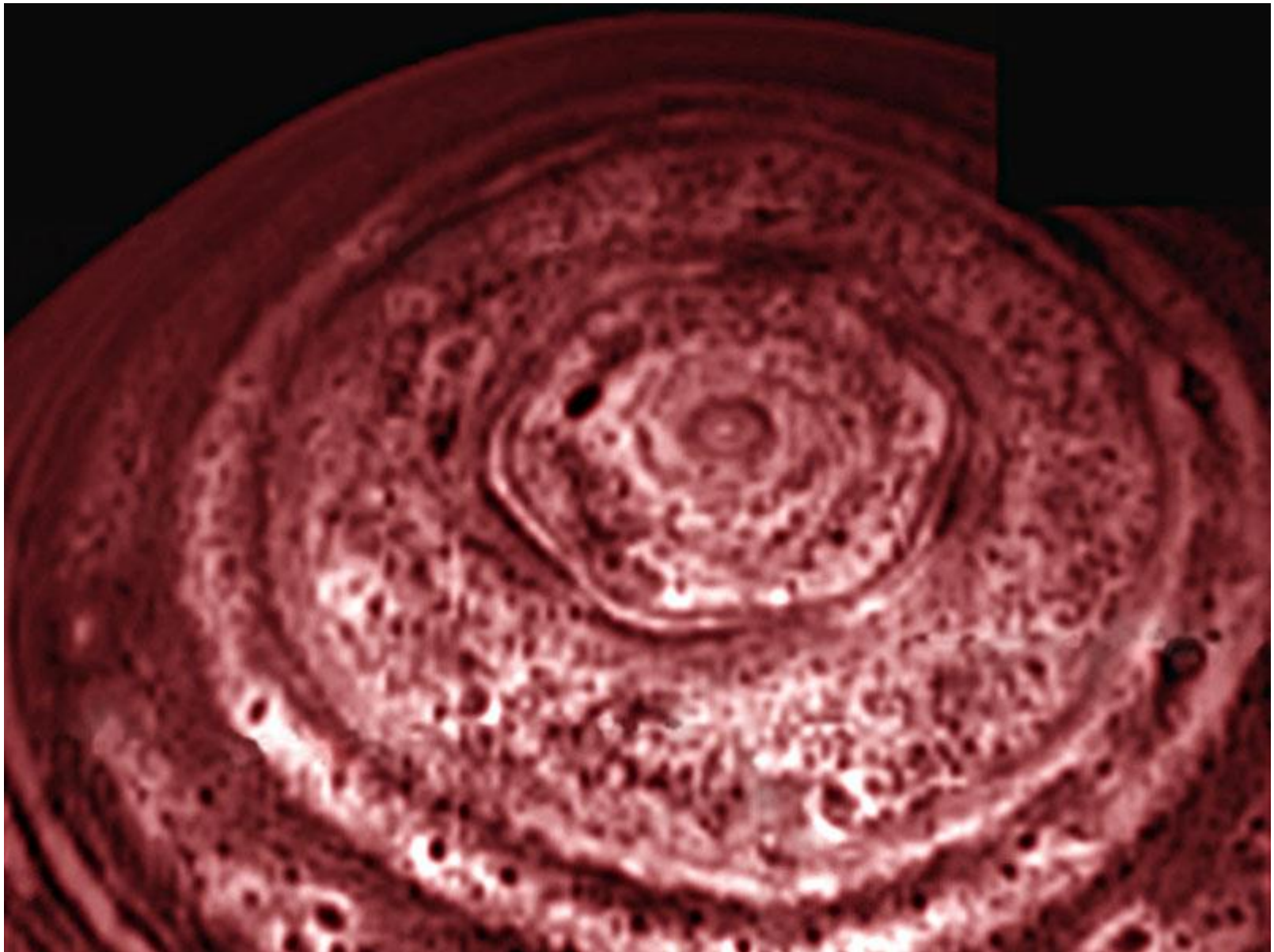


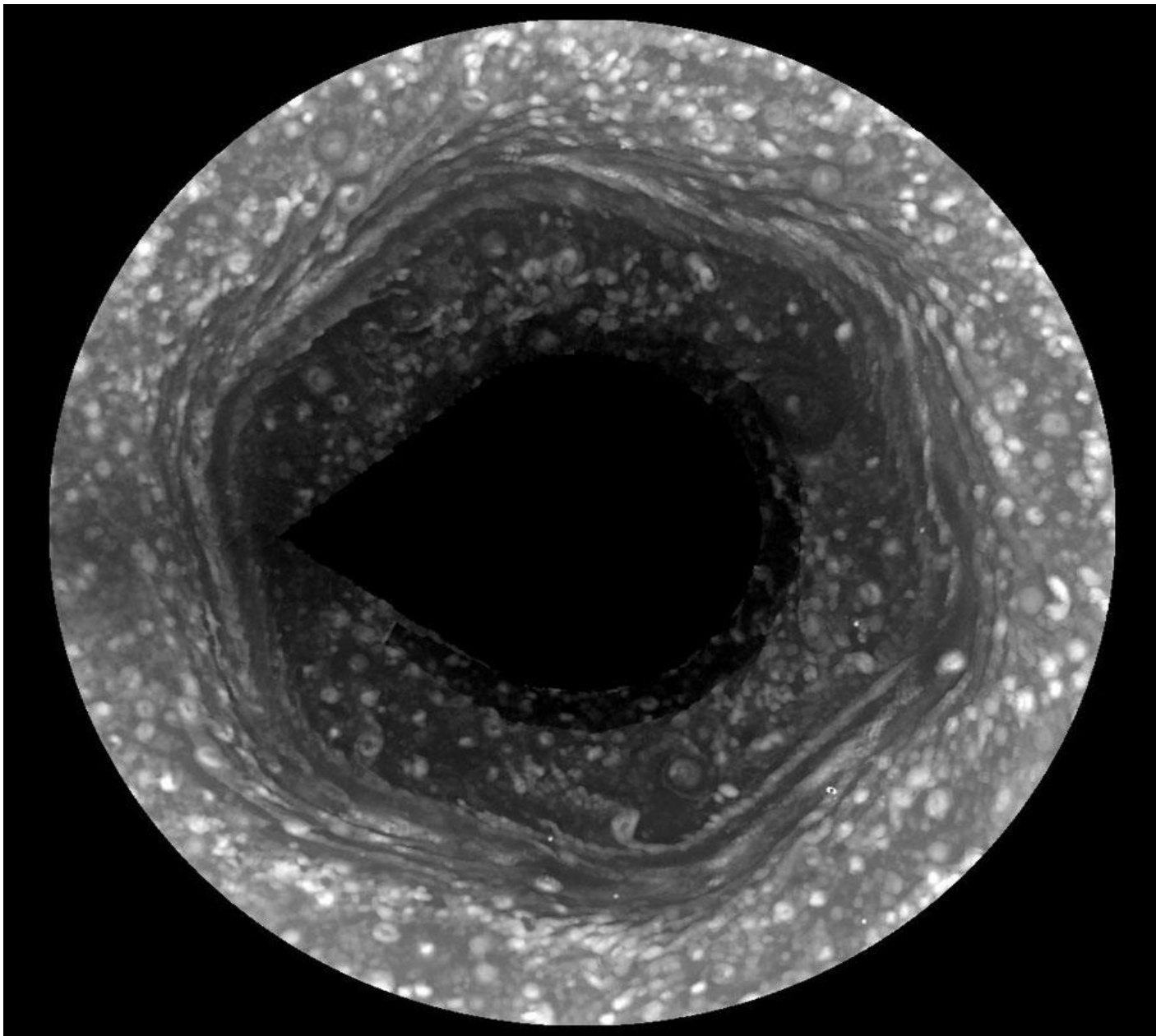


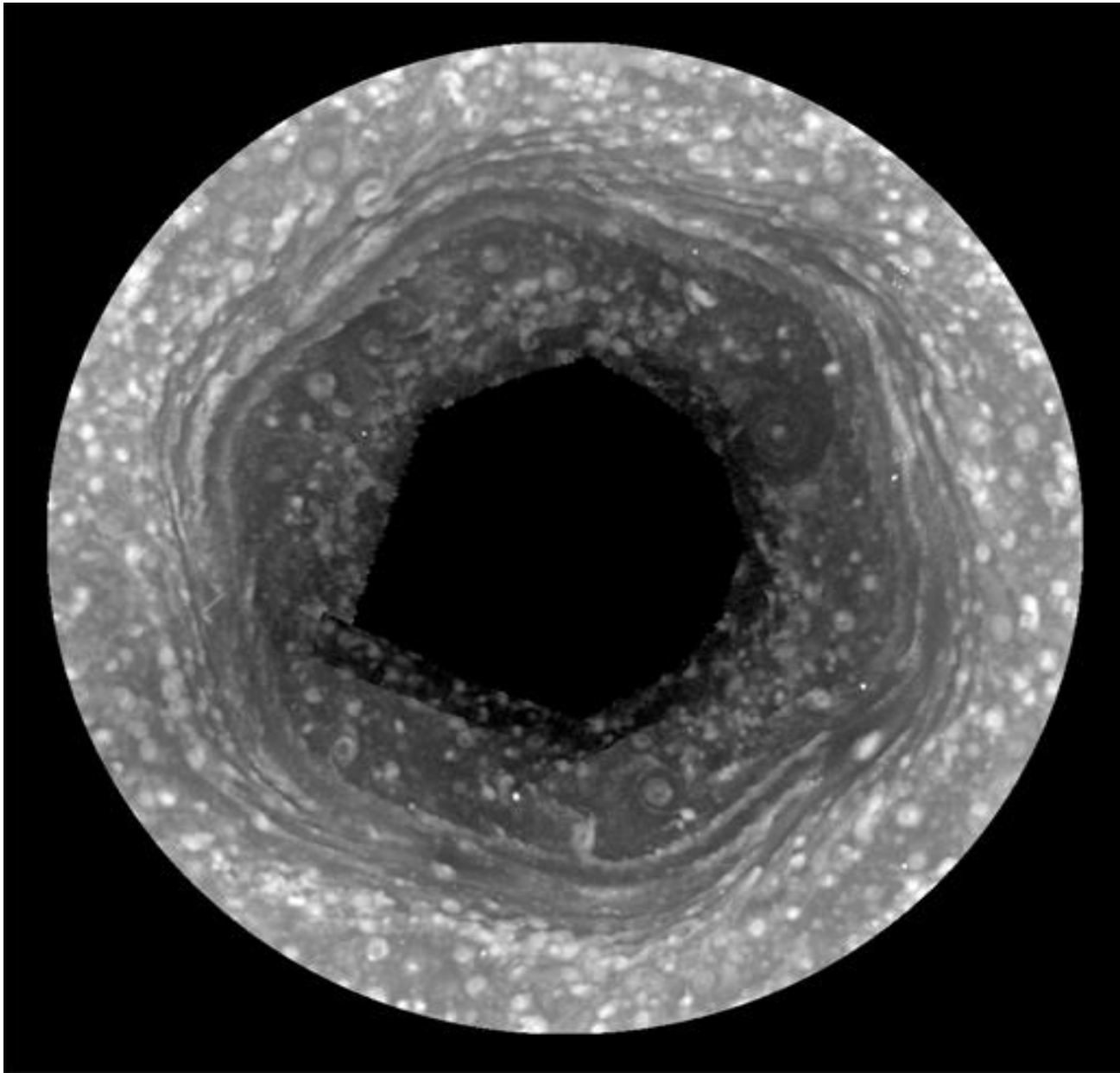


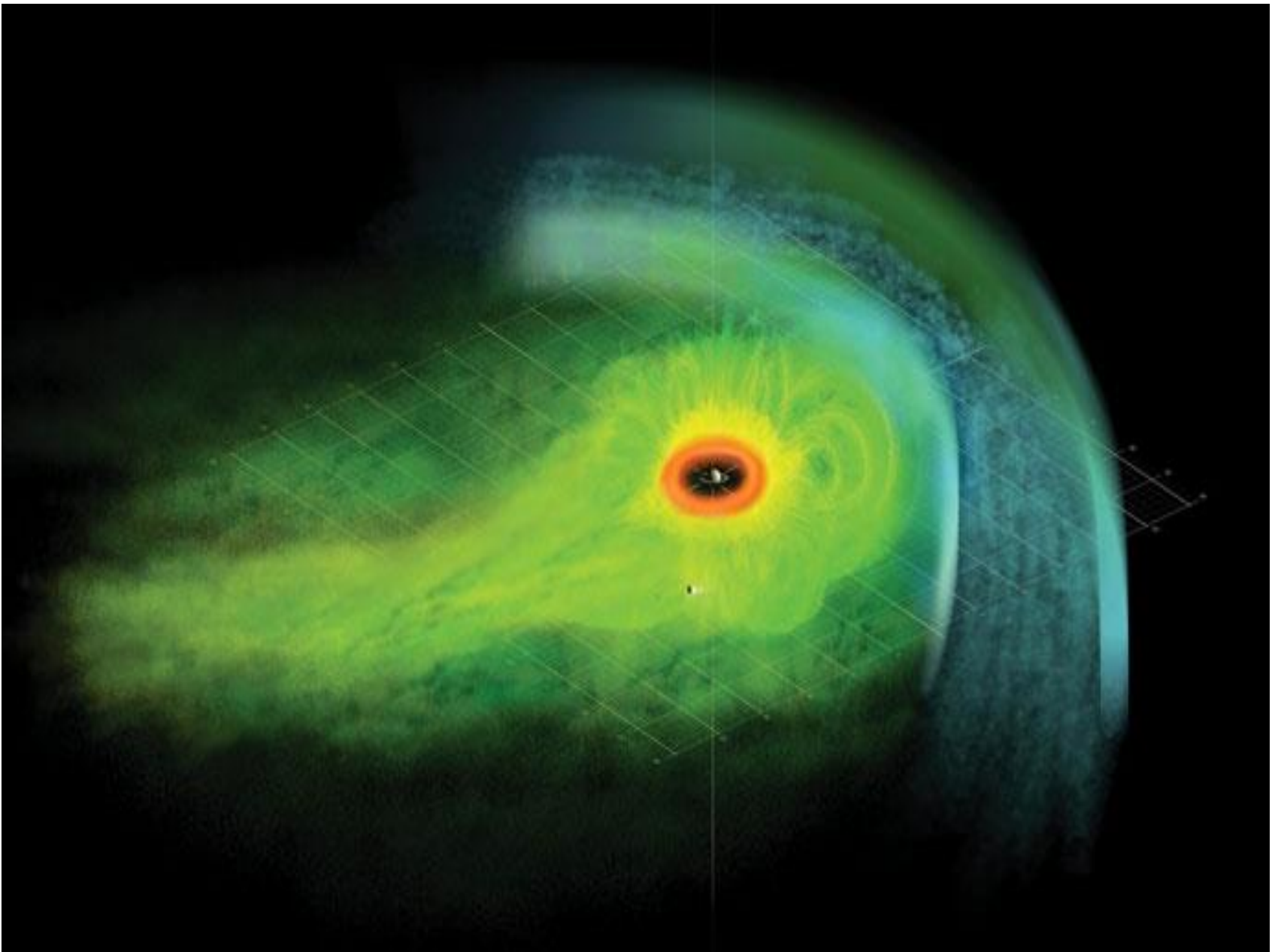


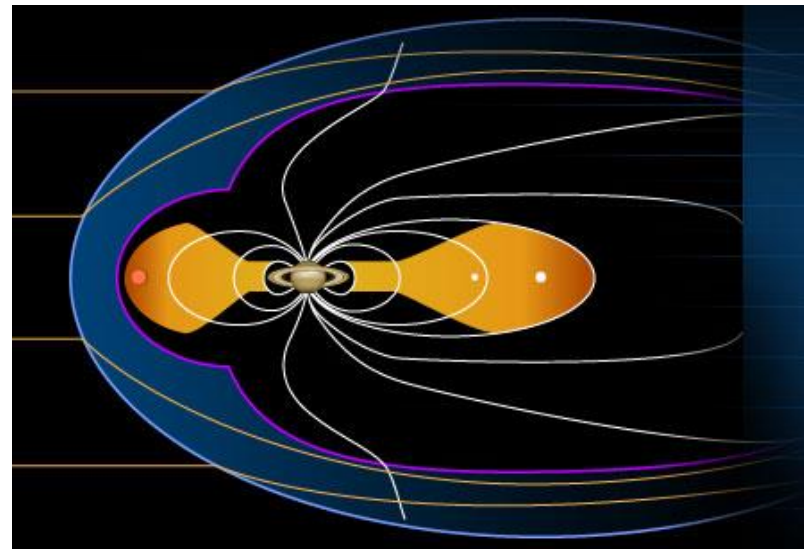
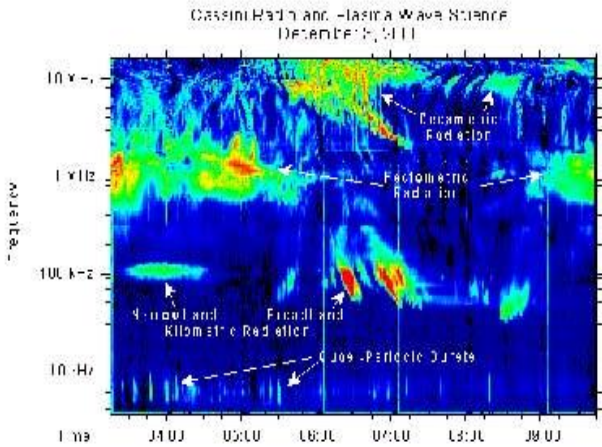
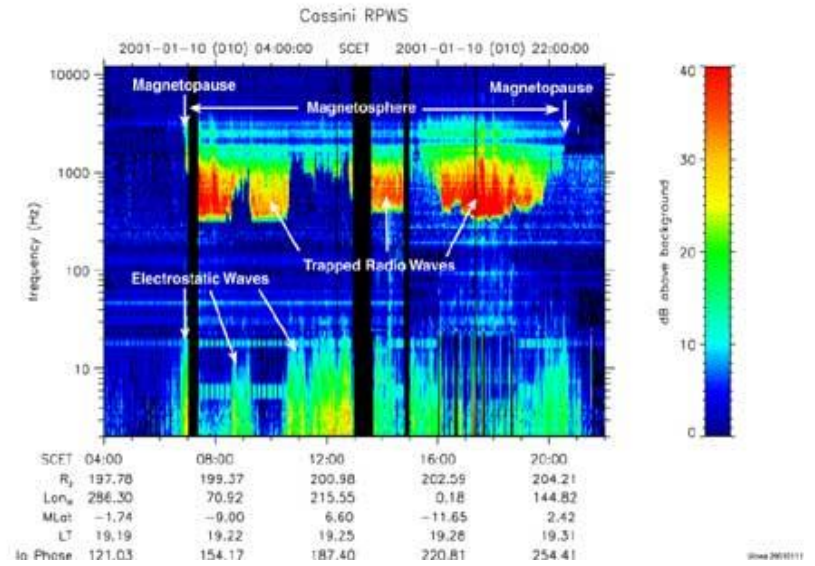
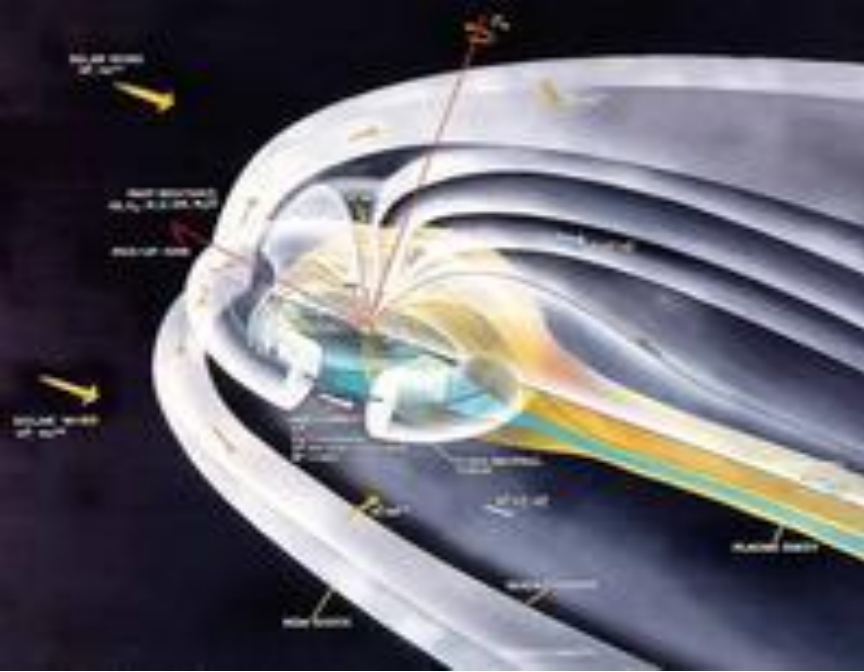


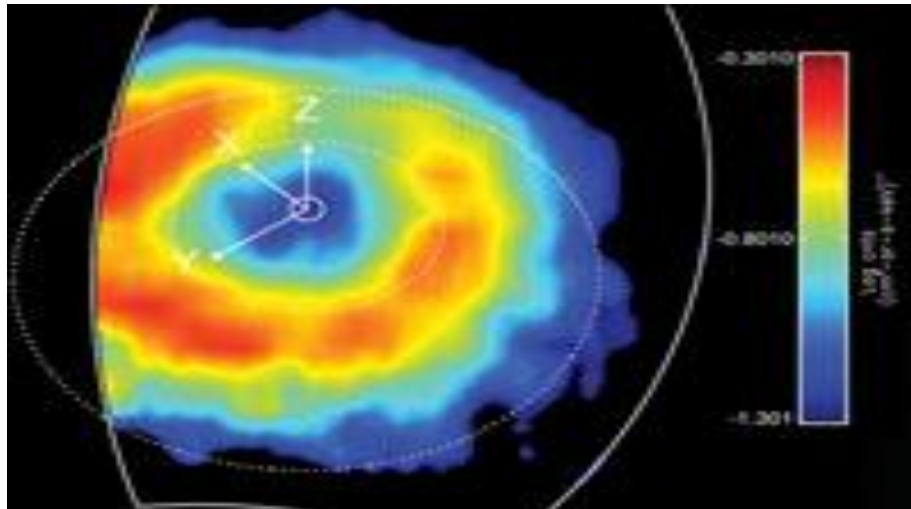
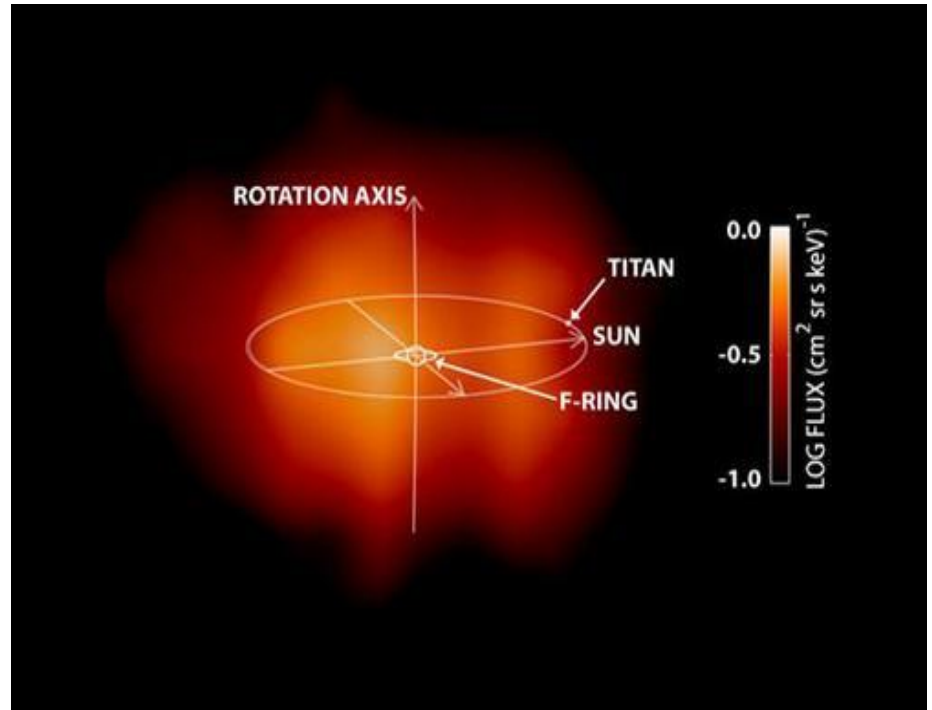
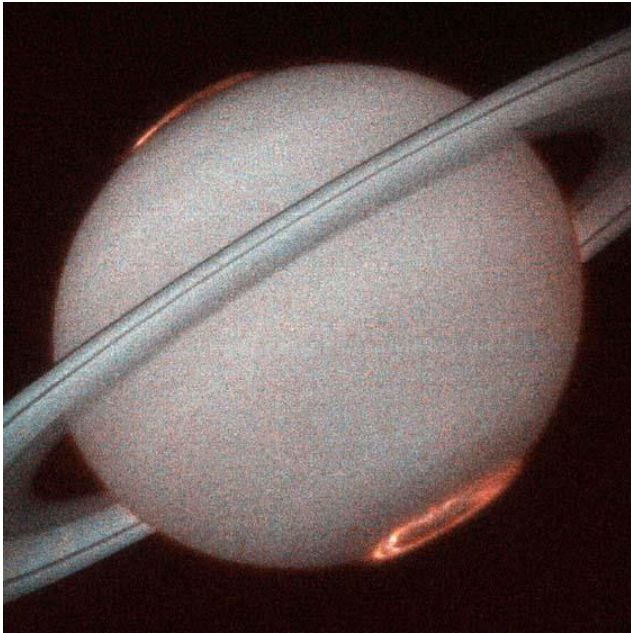


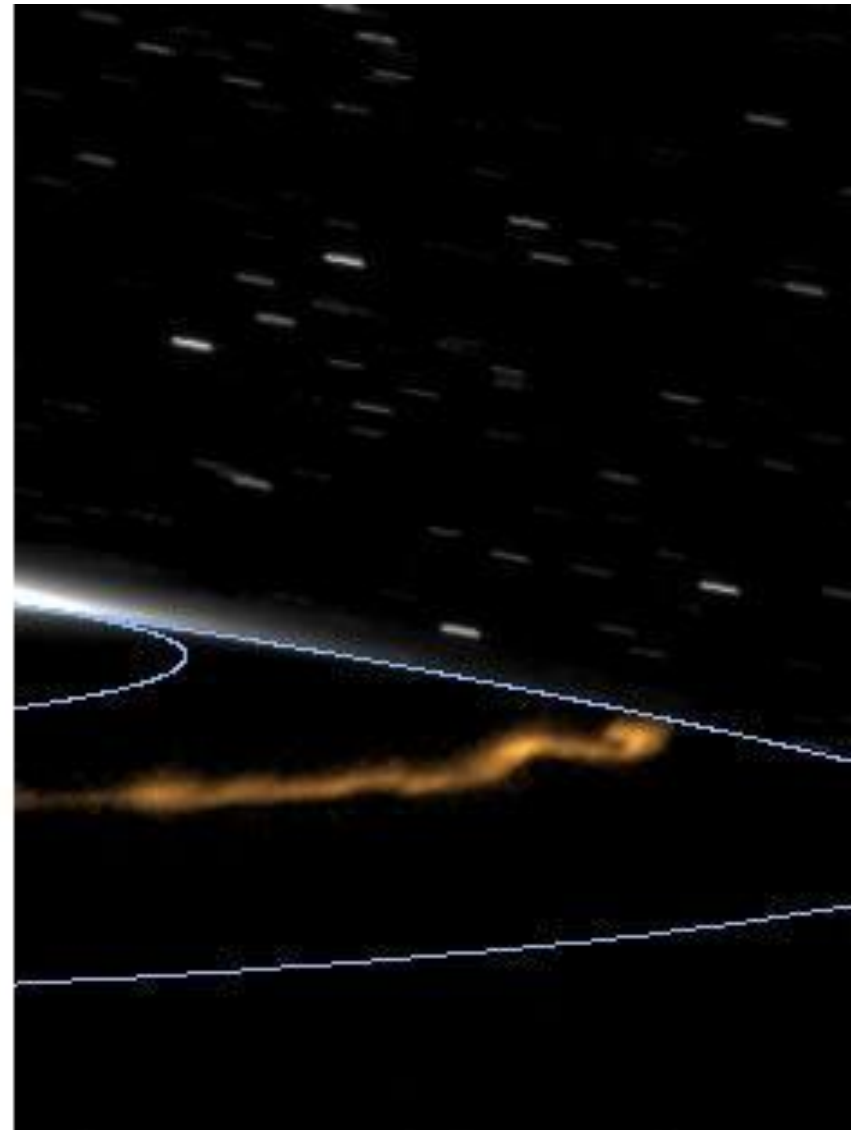
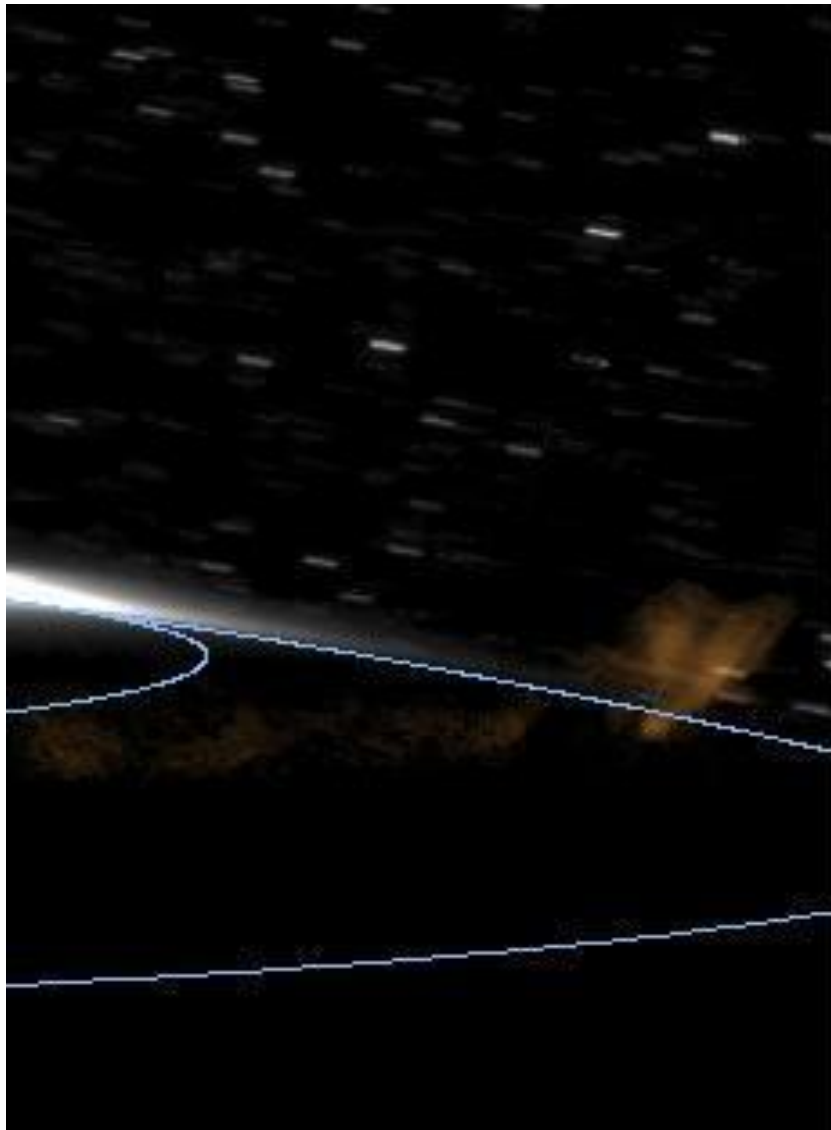


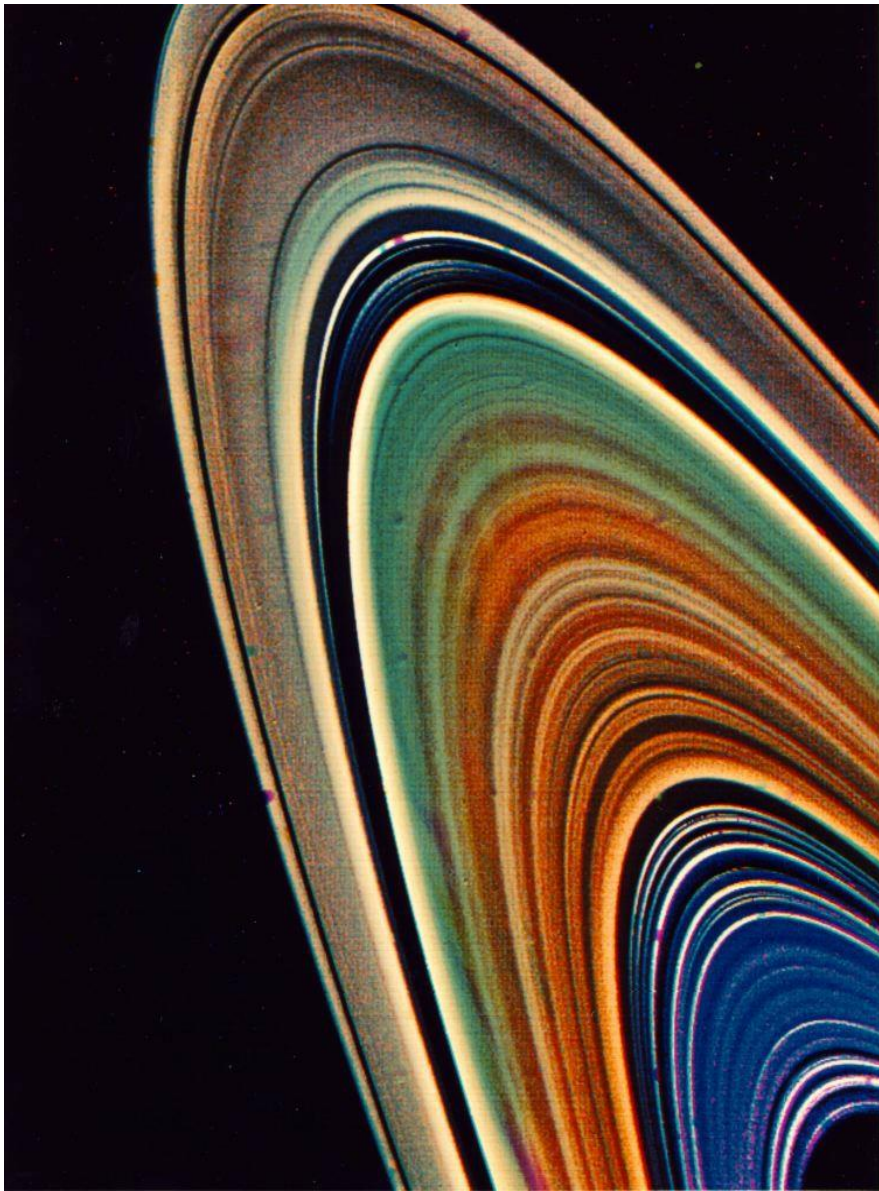


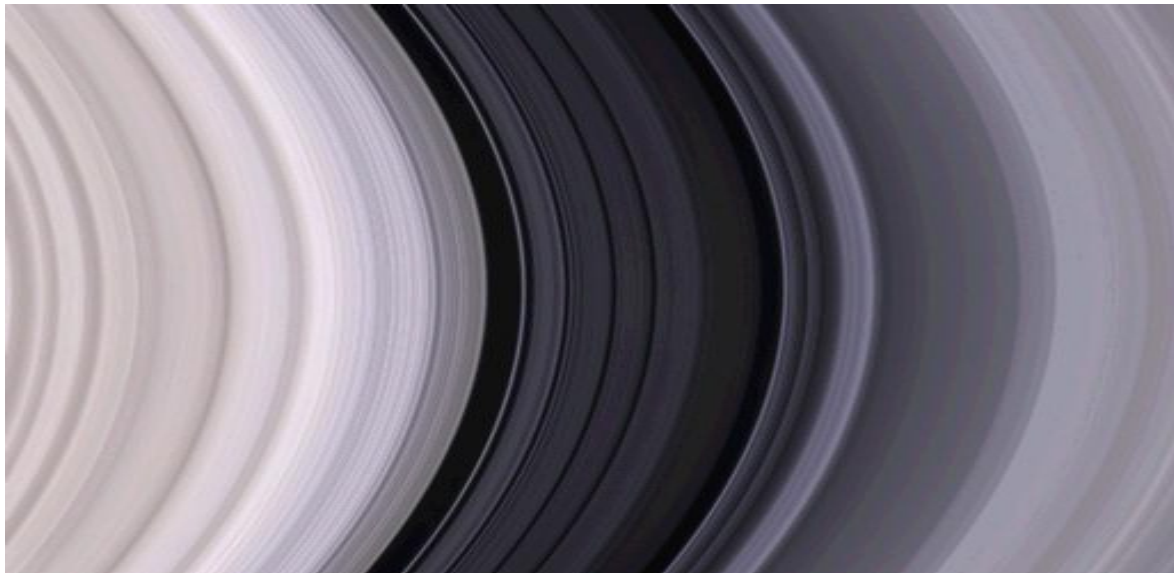
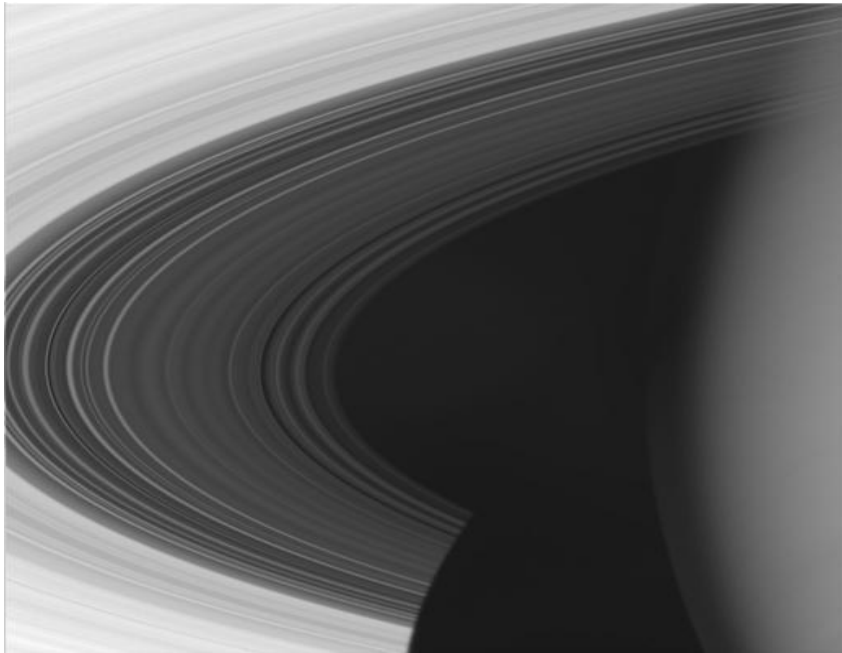


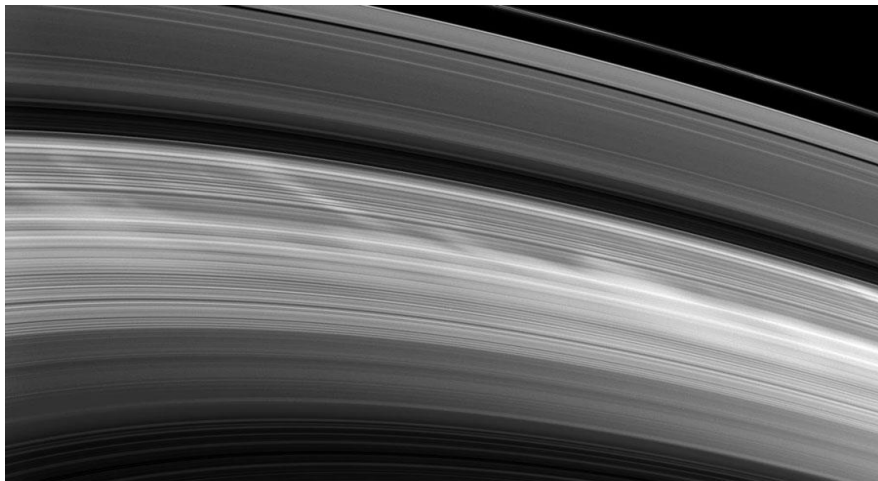
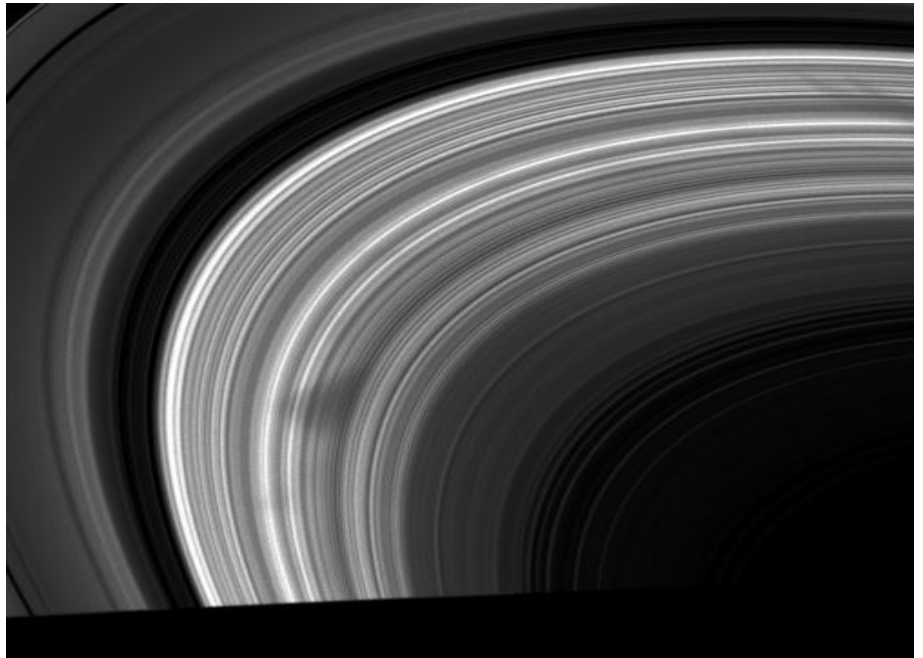
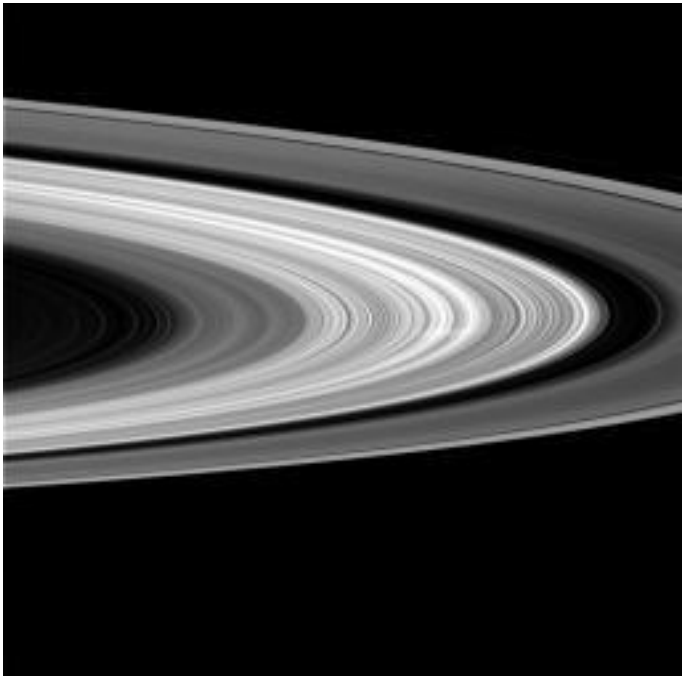


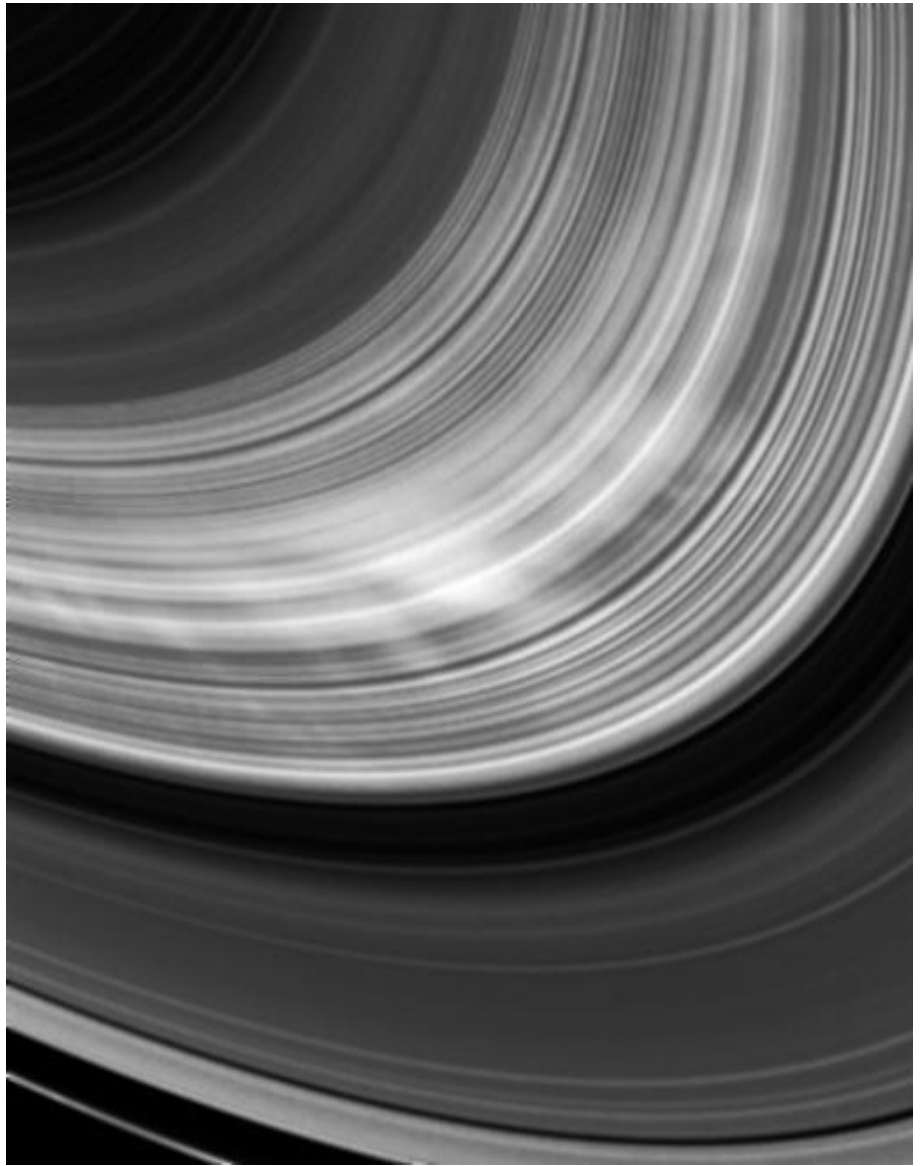
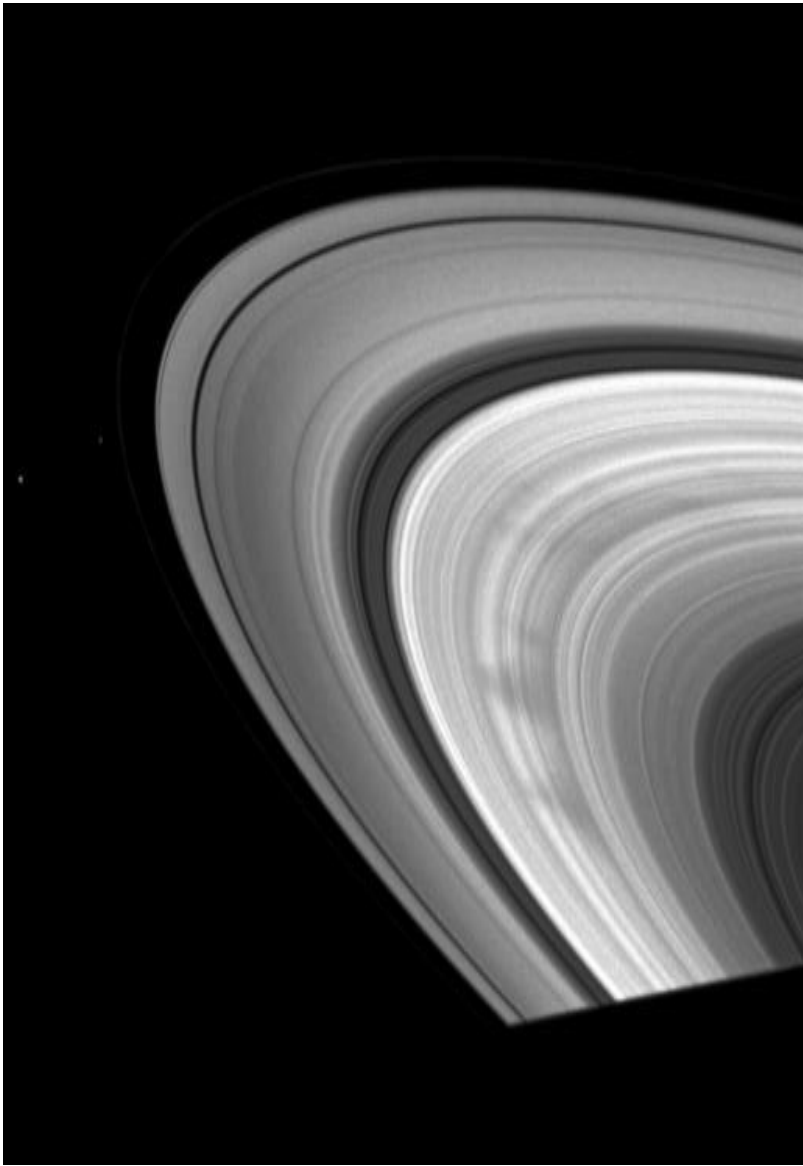




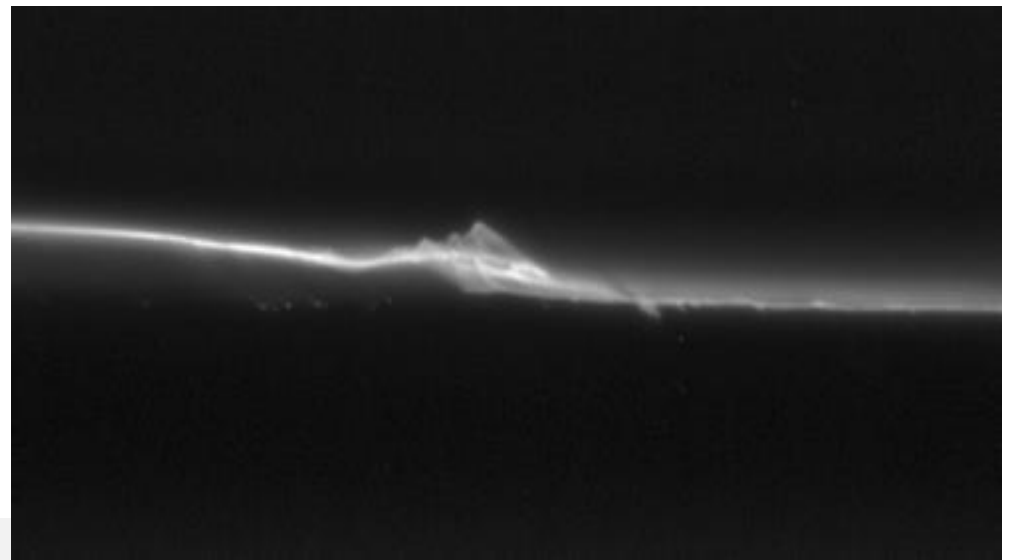
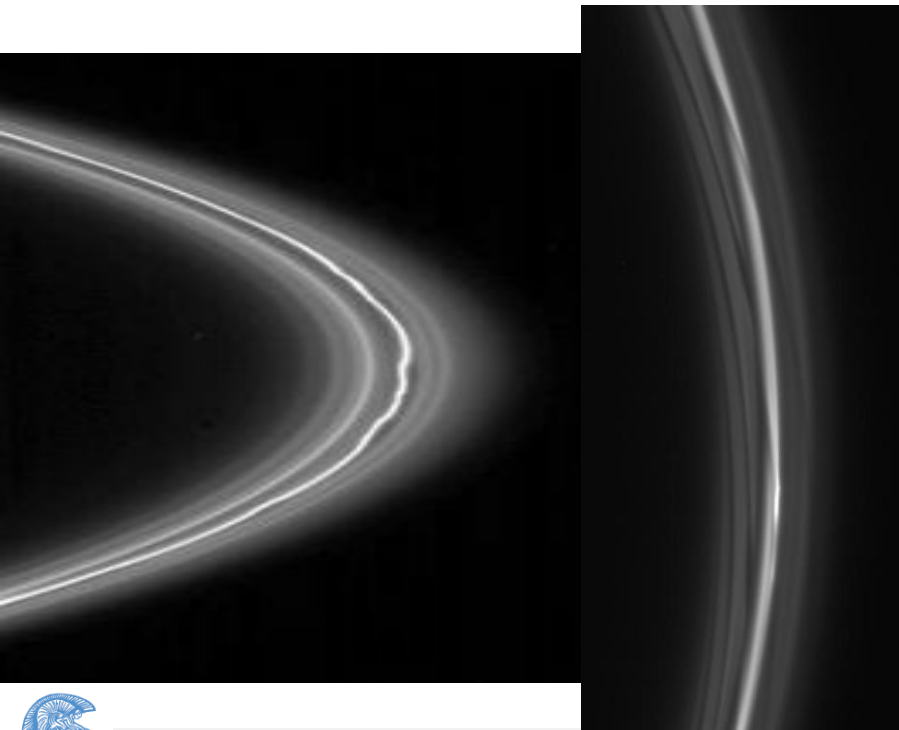


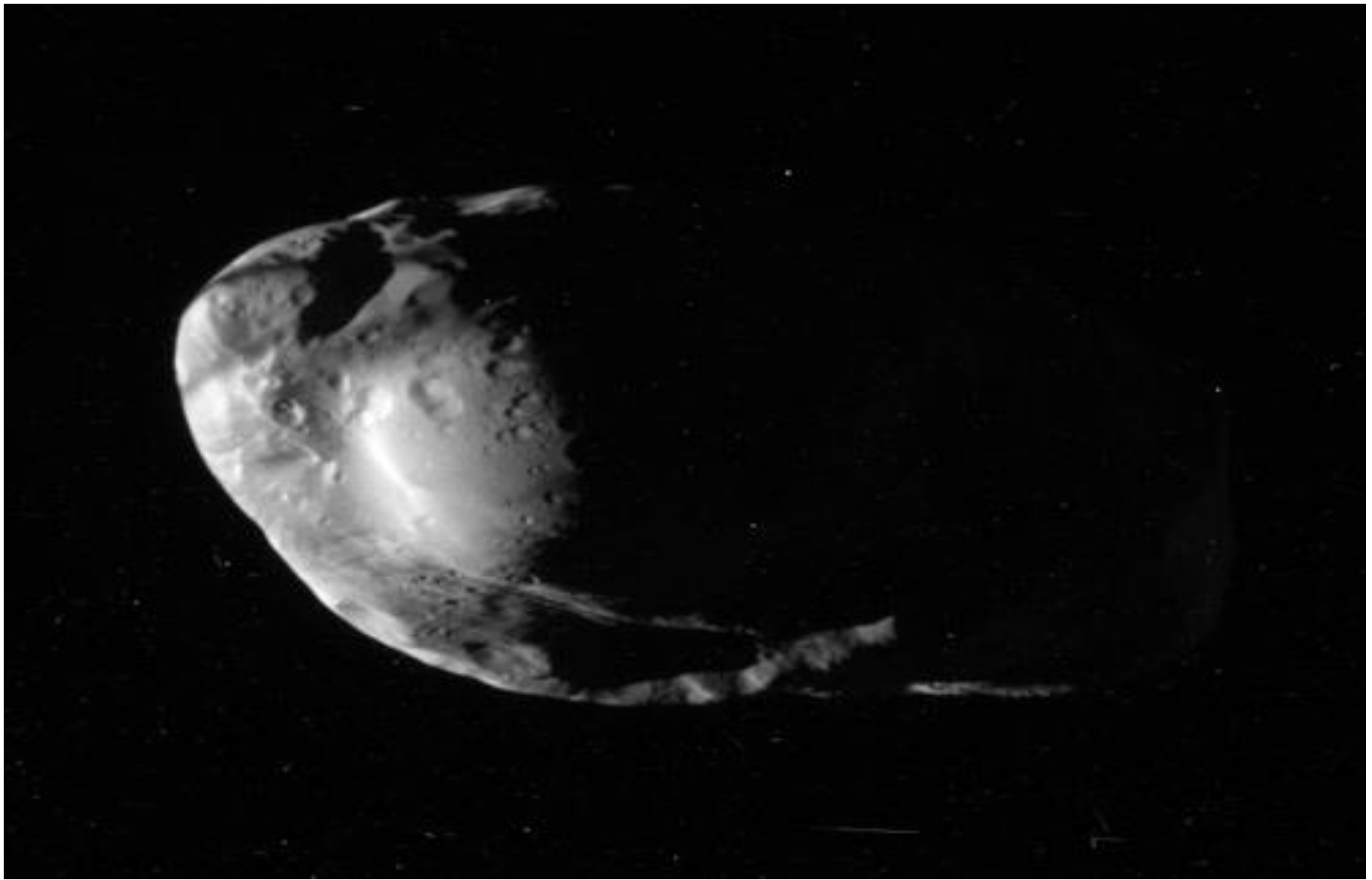


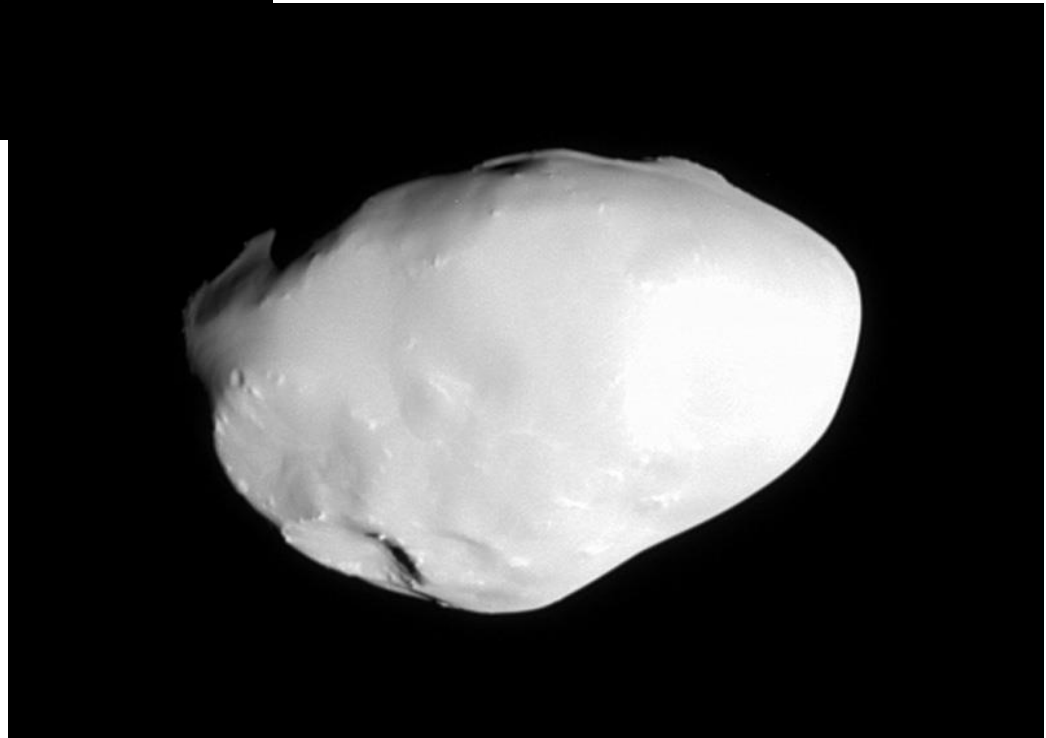


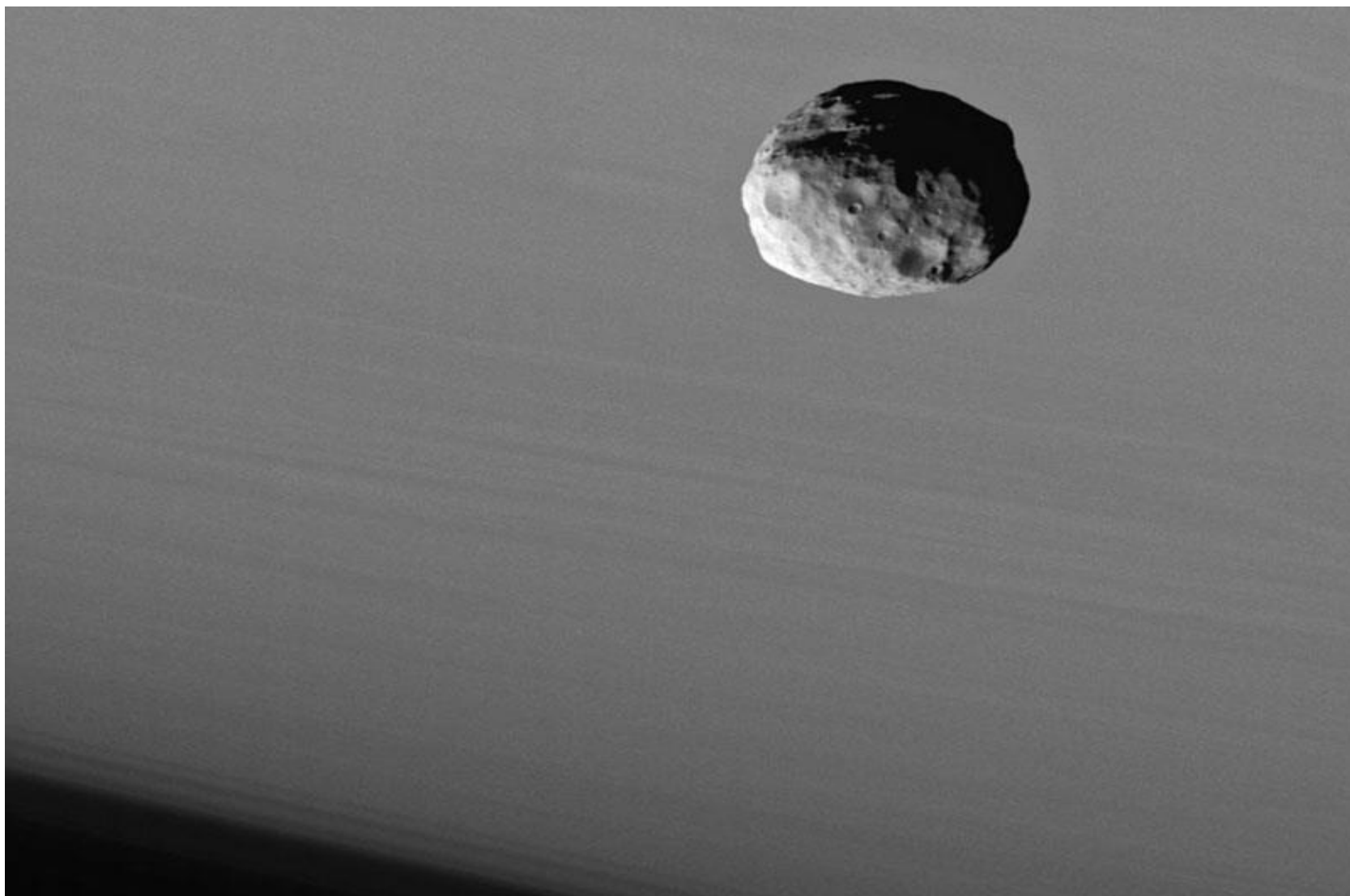




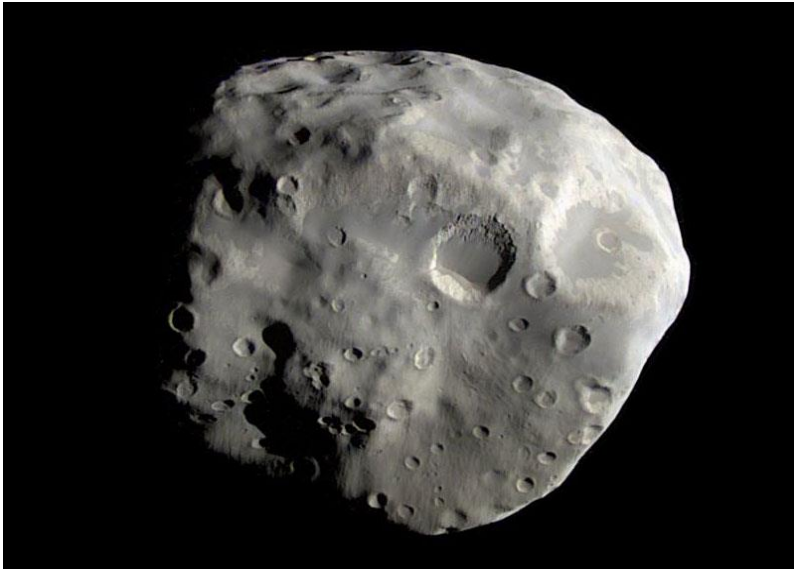


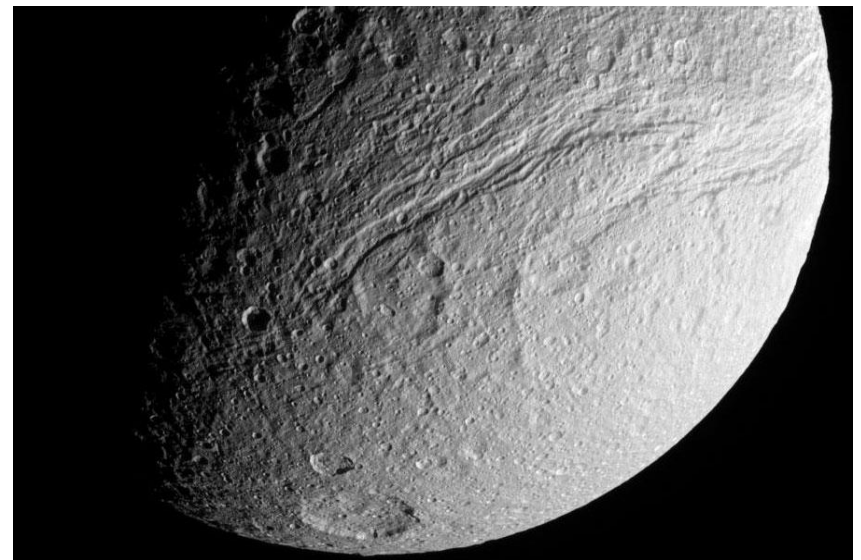
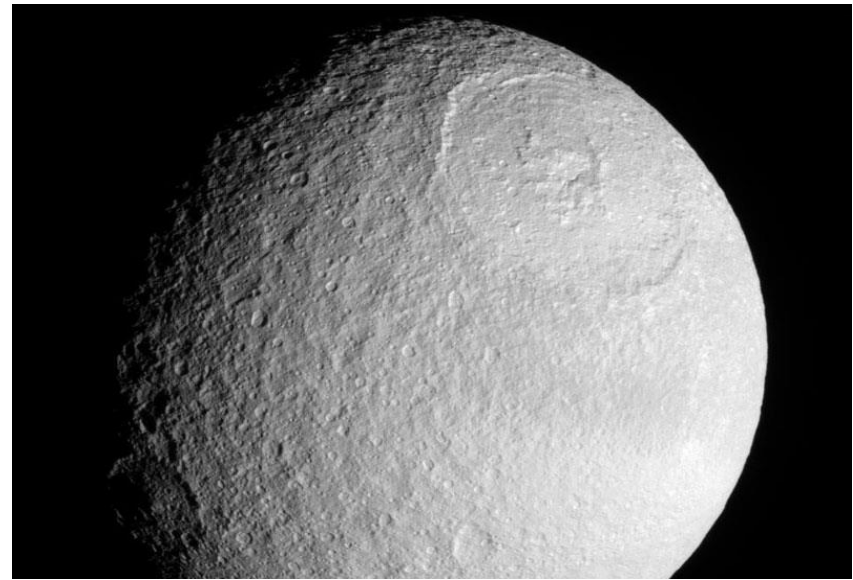
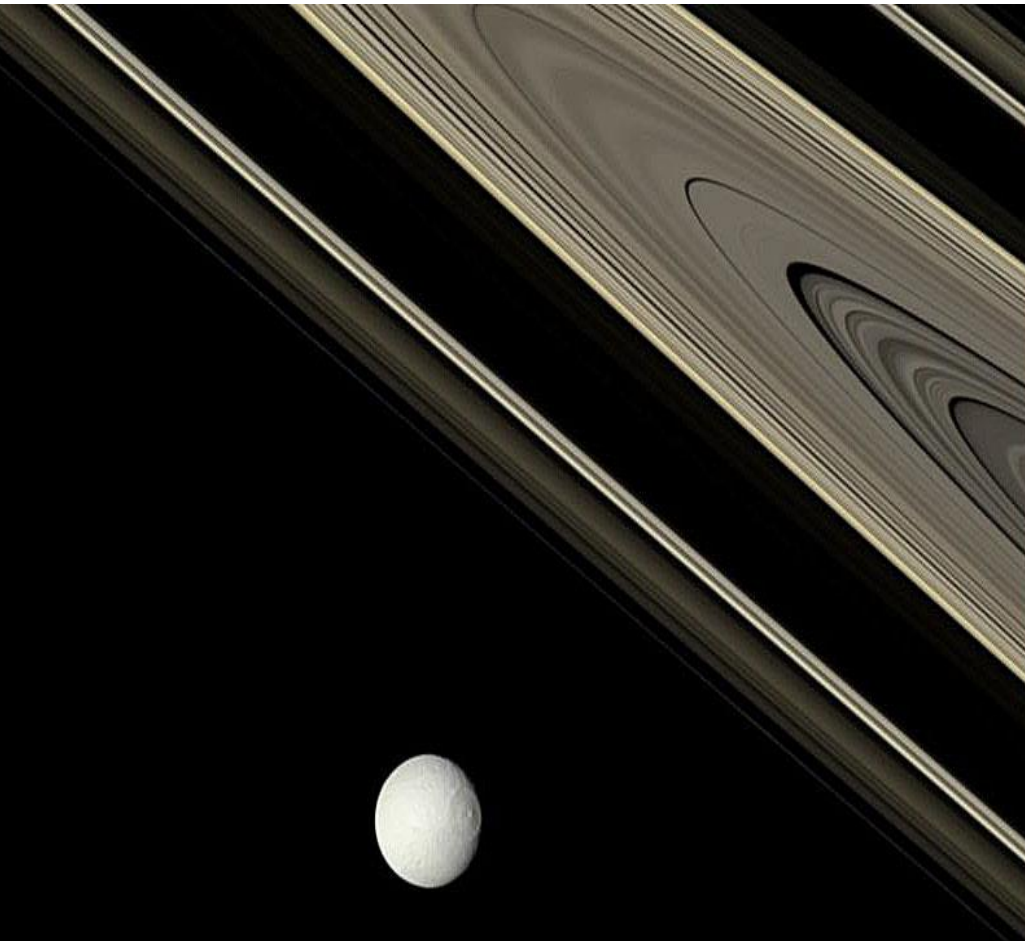


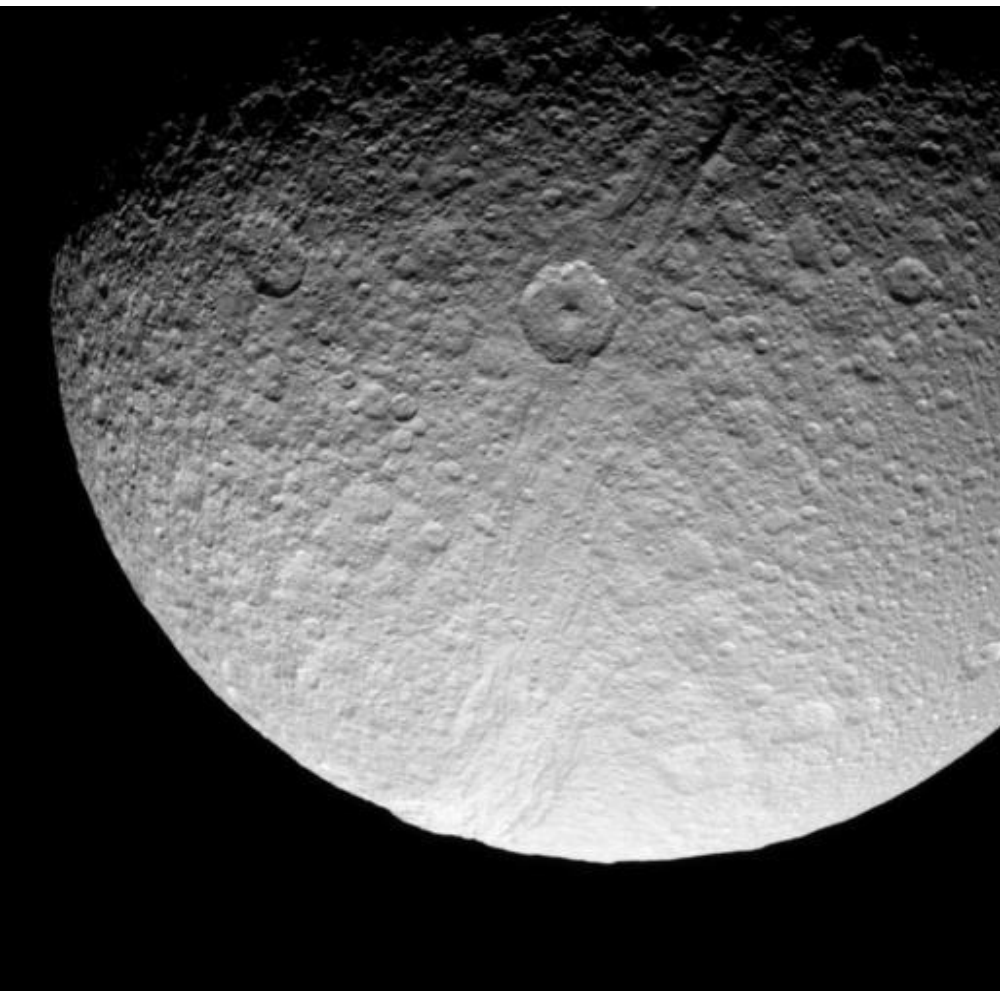


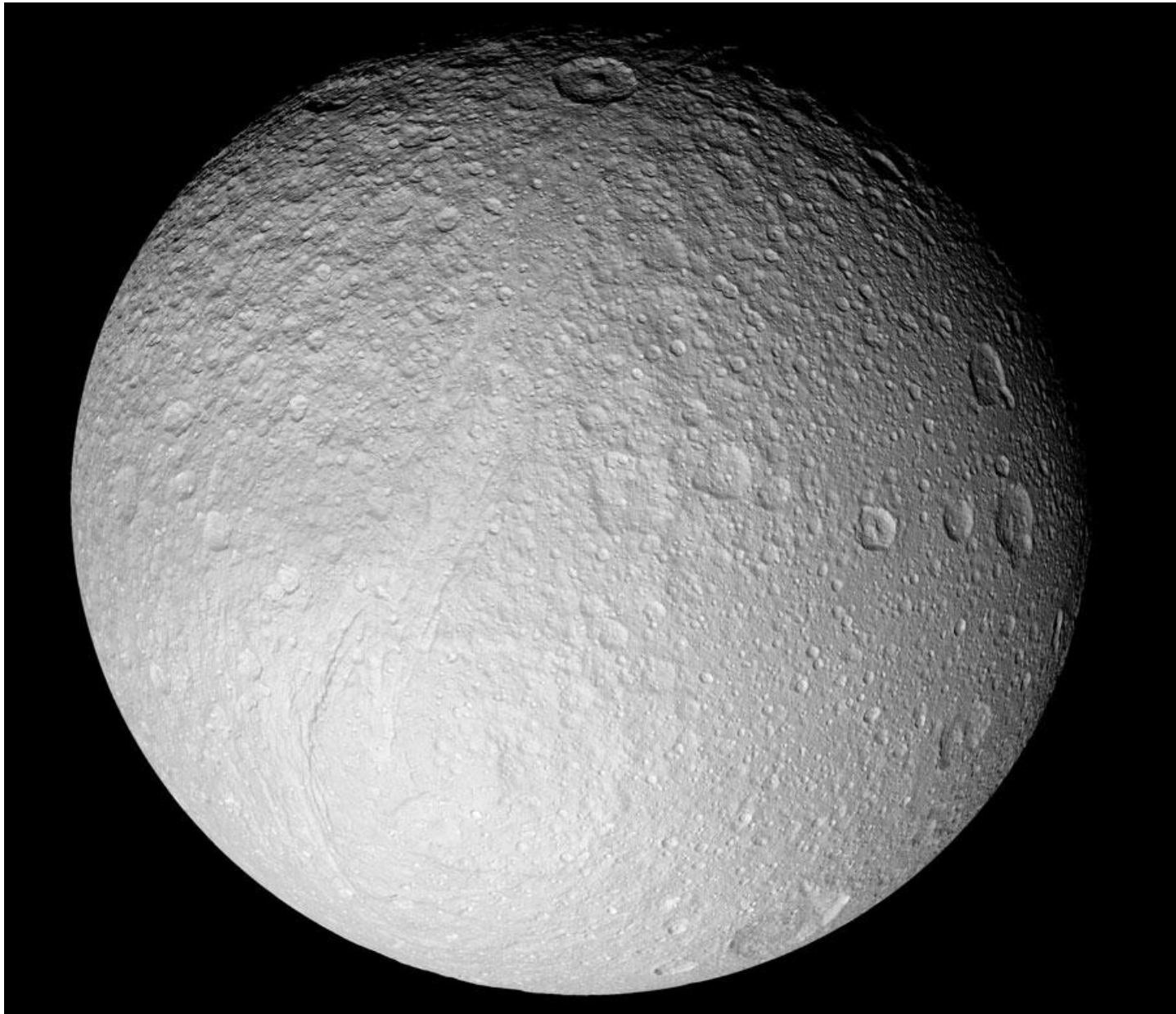






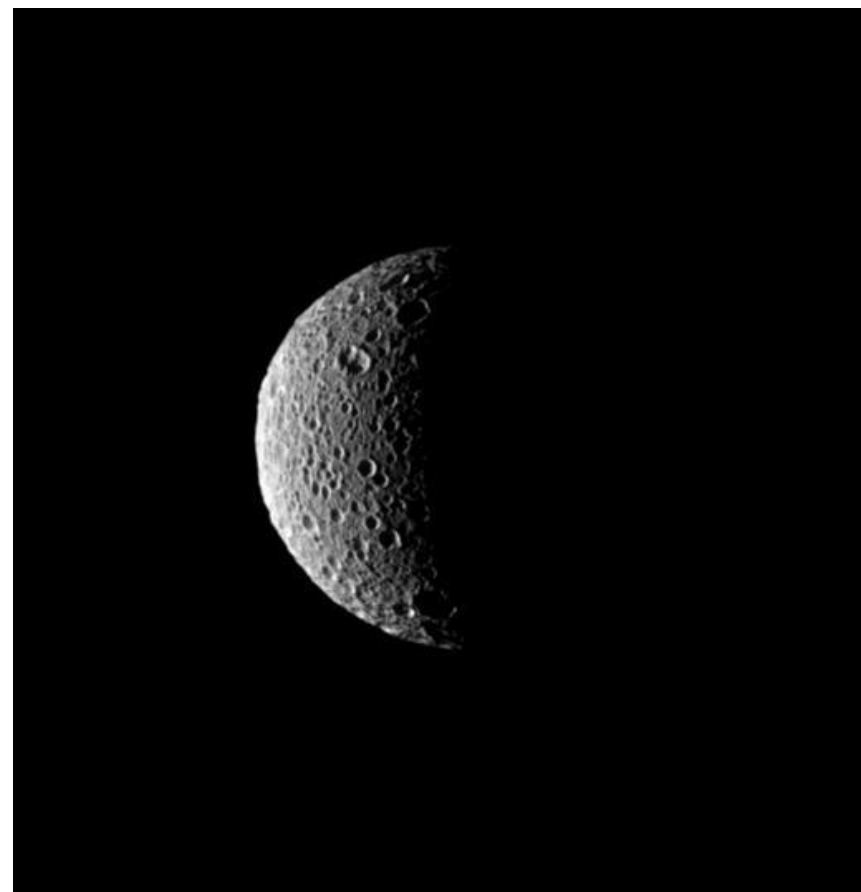


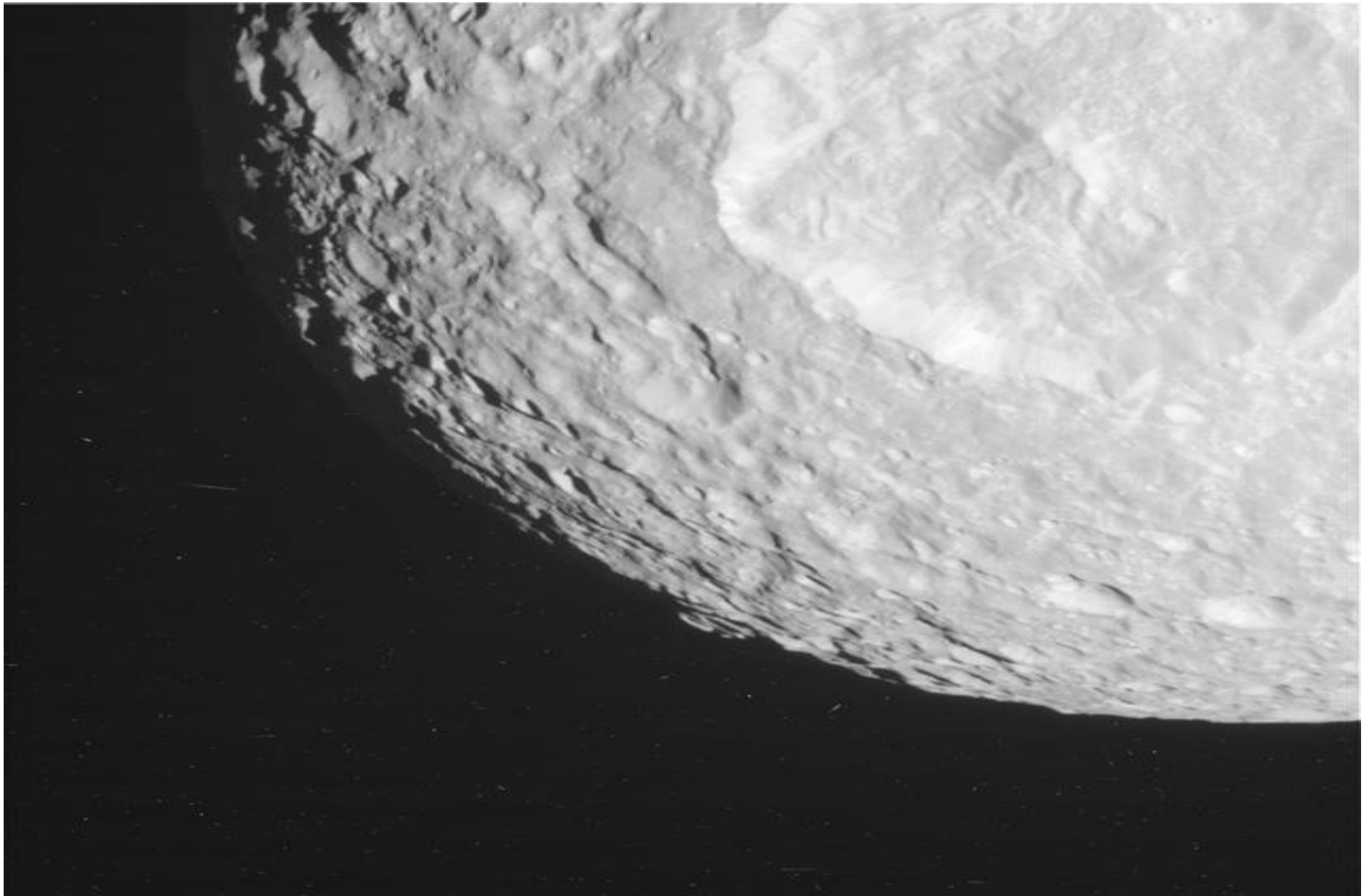


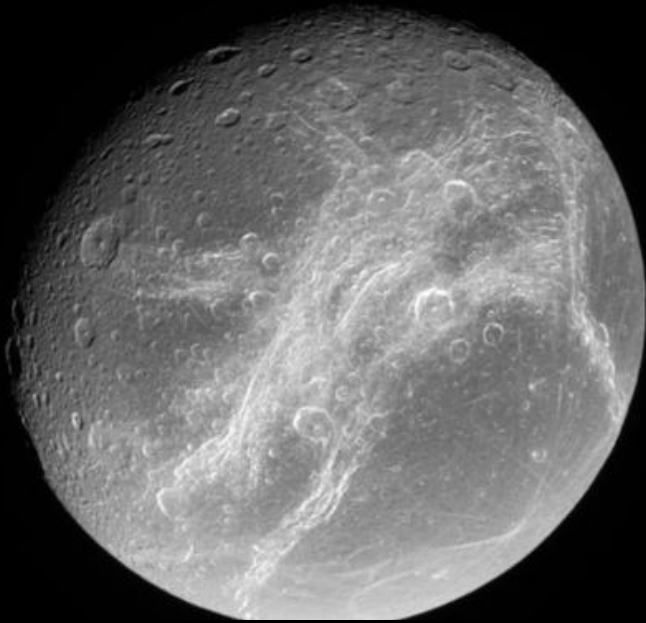


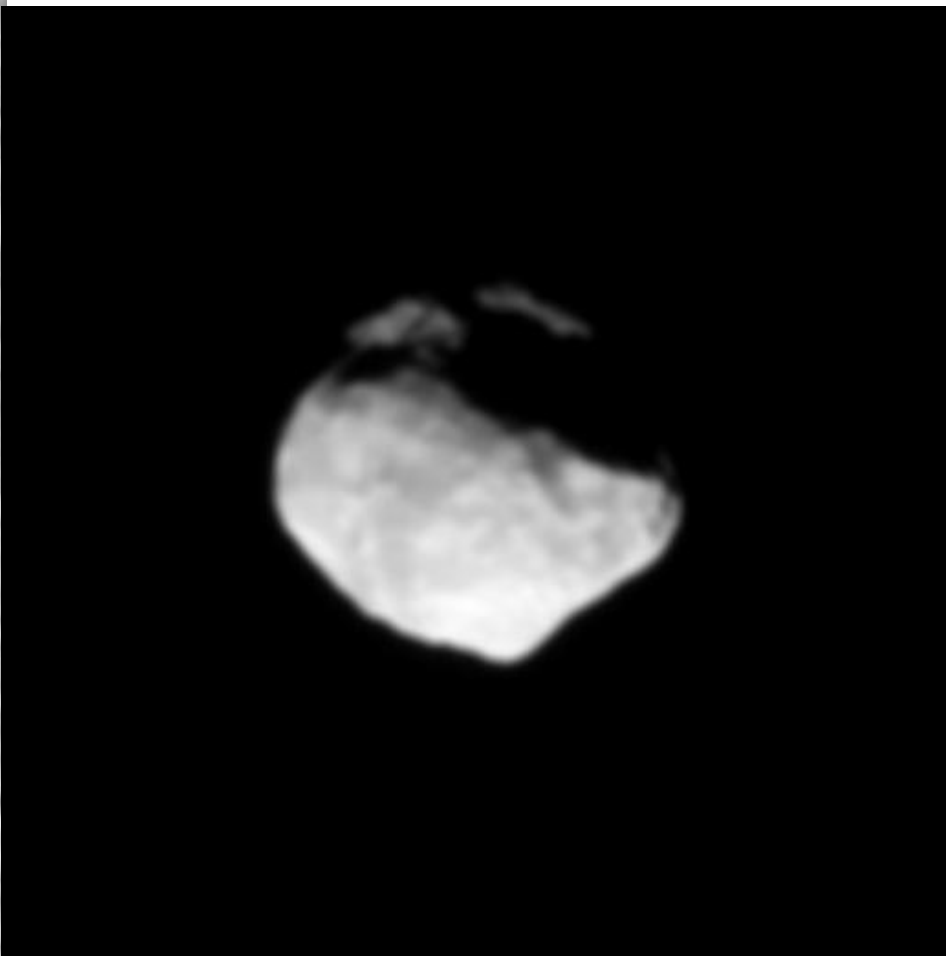
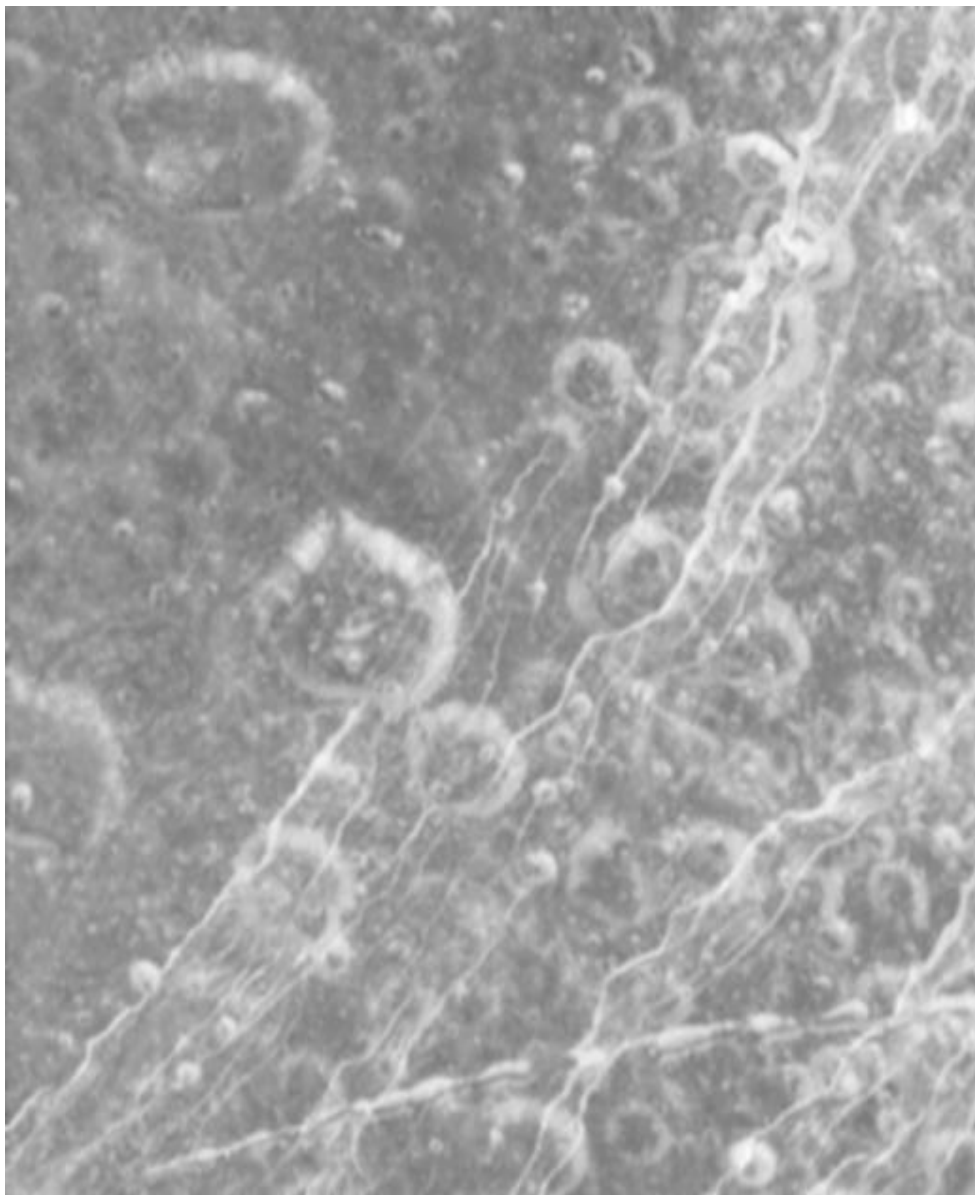
Saturn's Moons - *Select one of Saturn's moons*

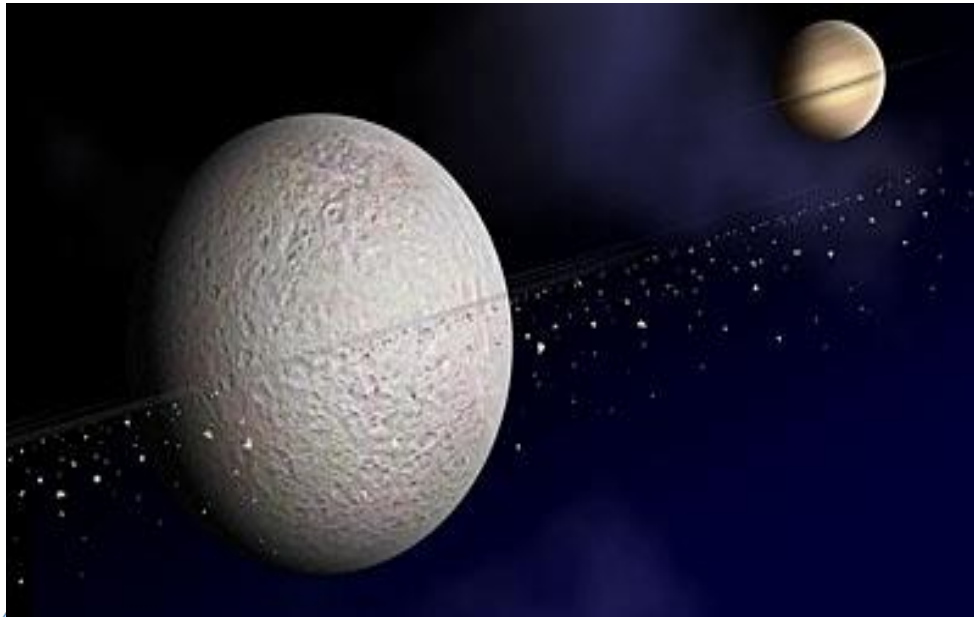
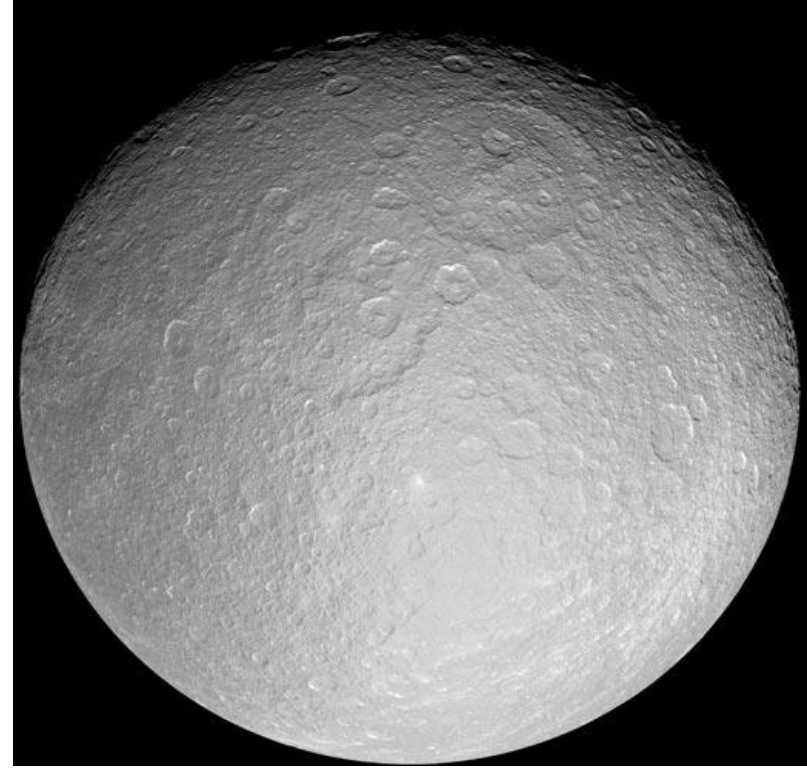
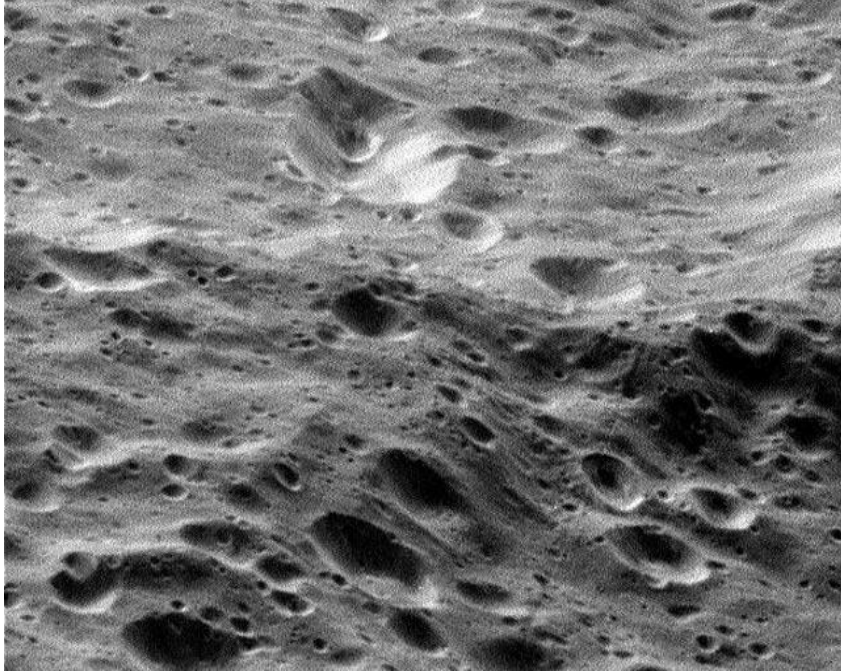


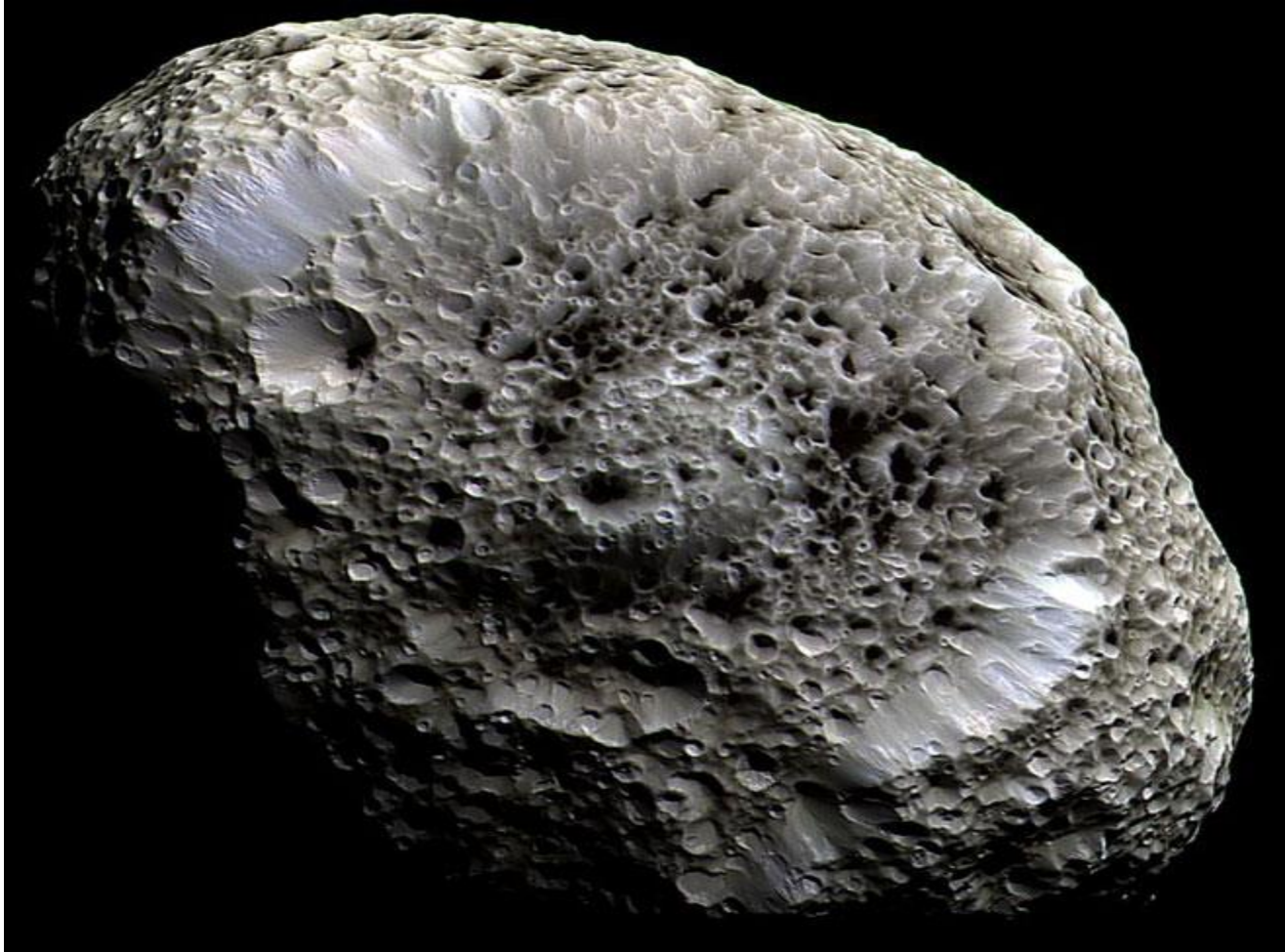


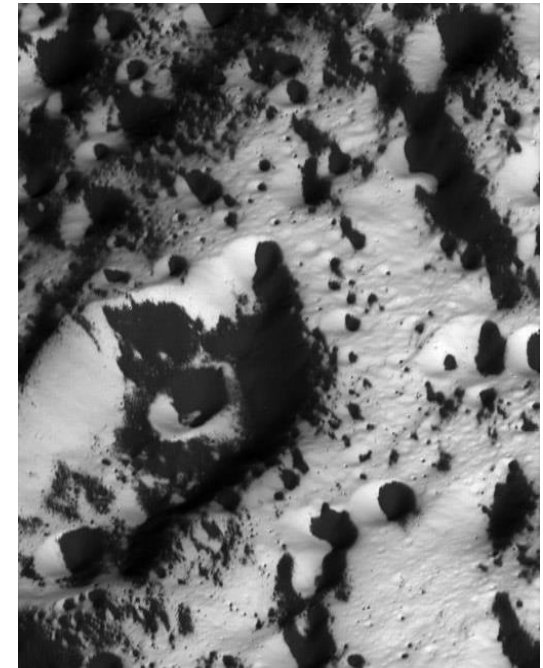
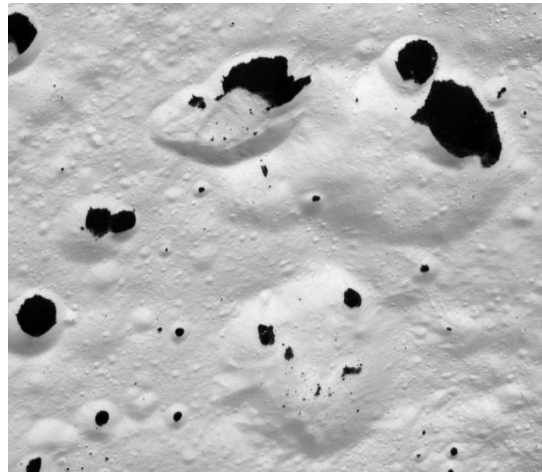
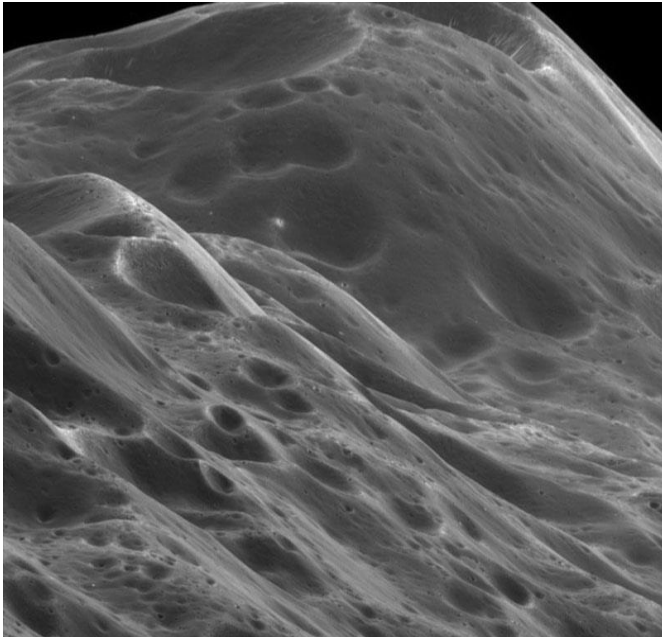
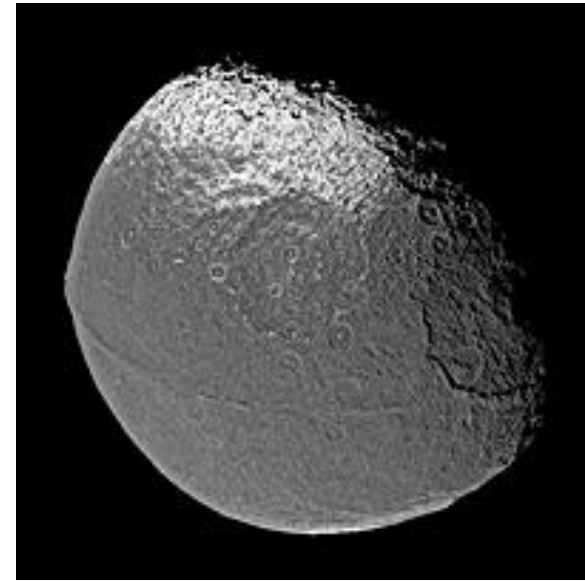
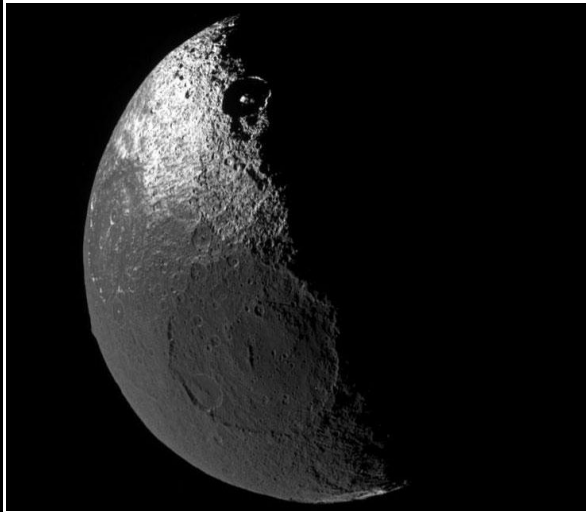
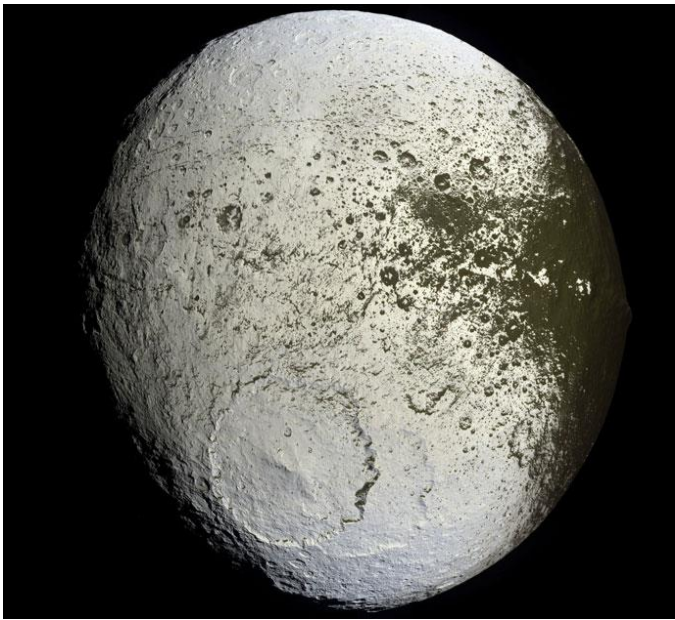


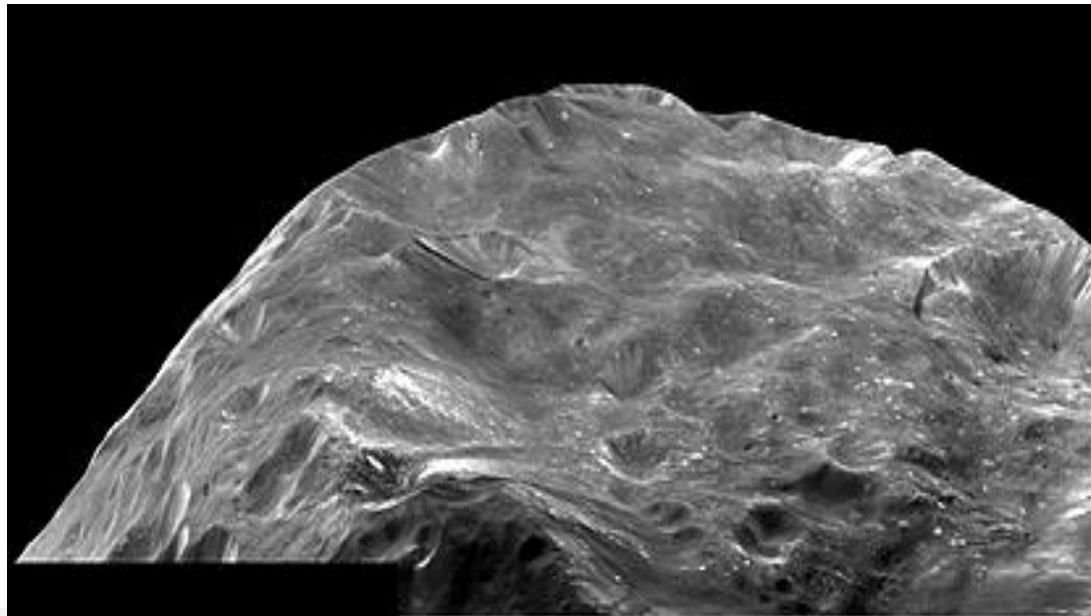
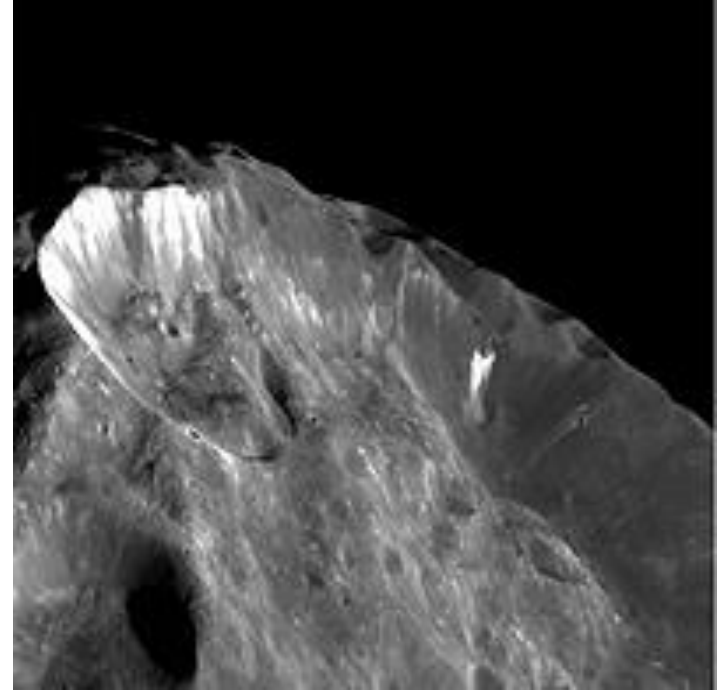




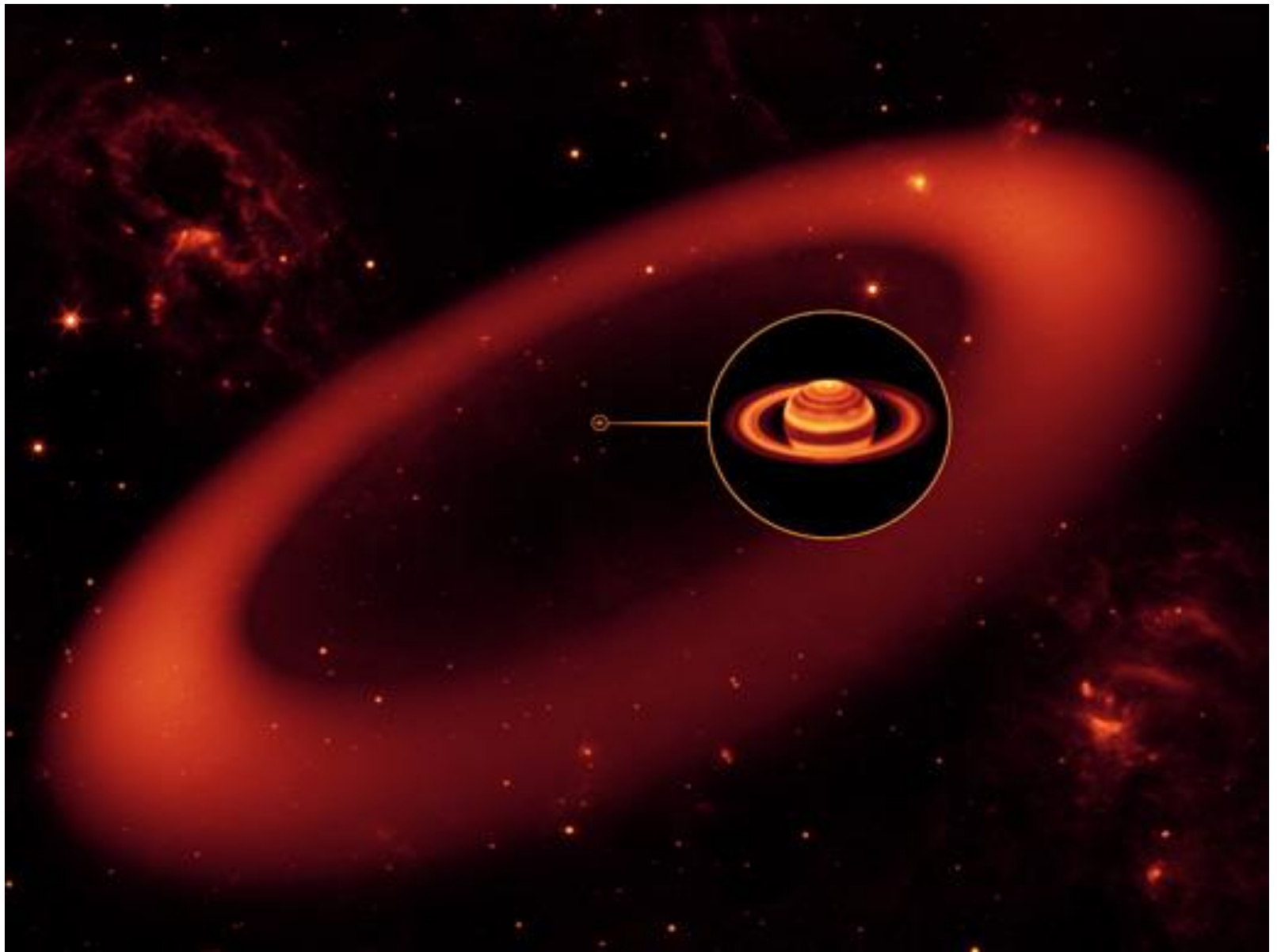


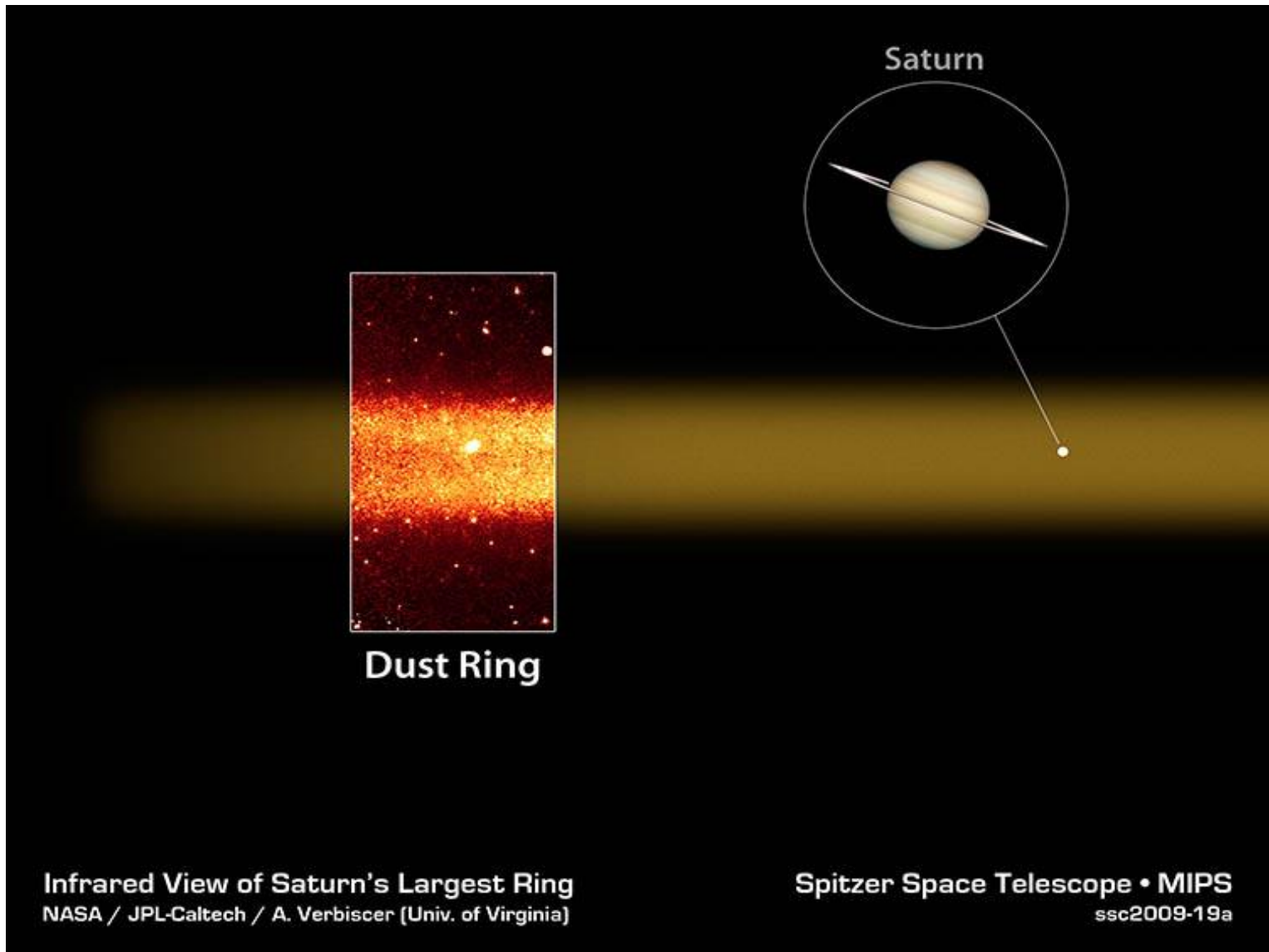












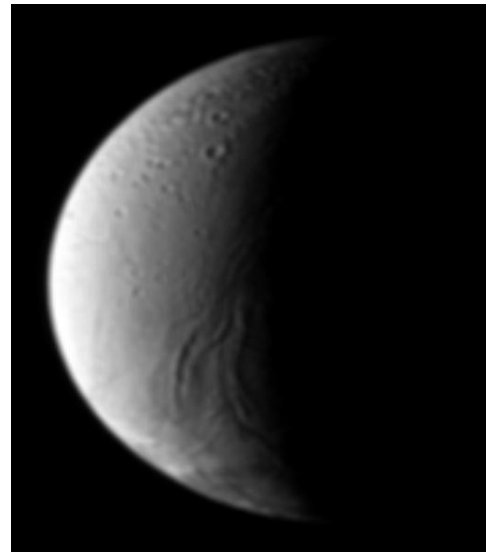
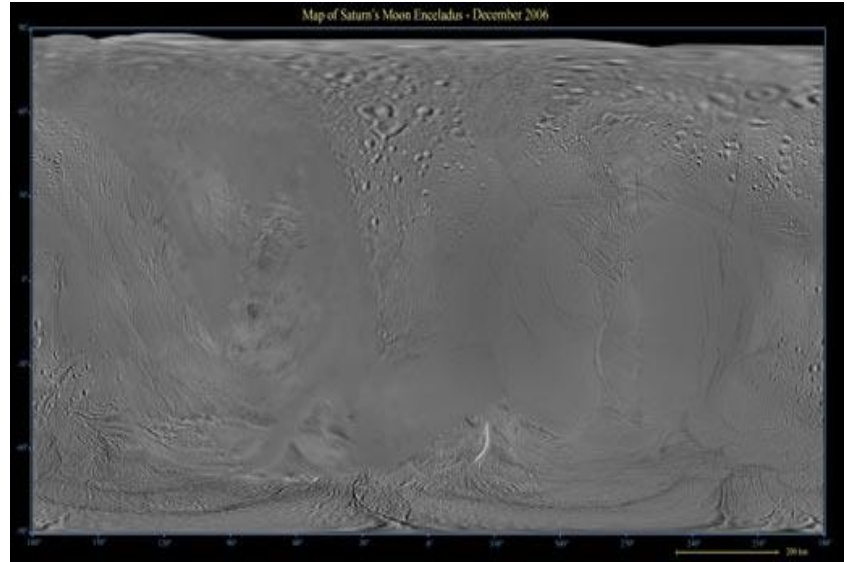
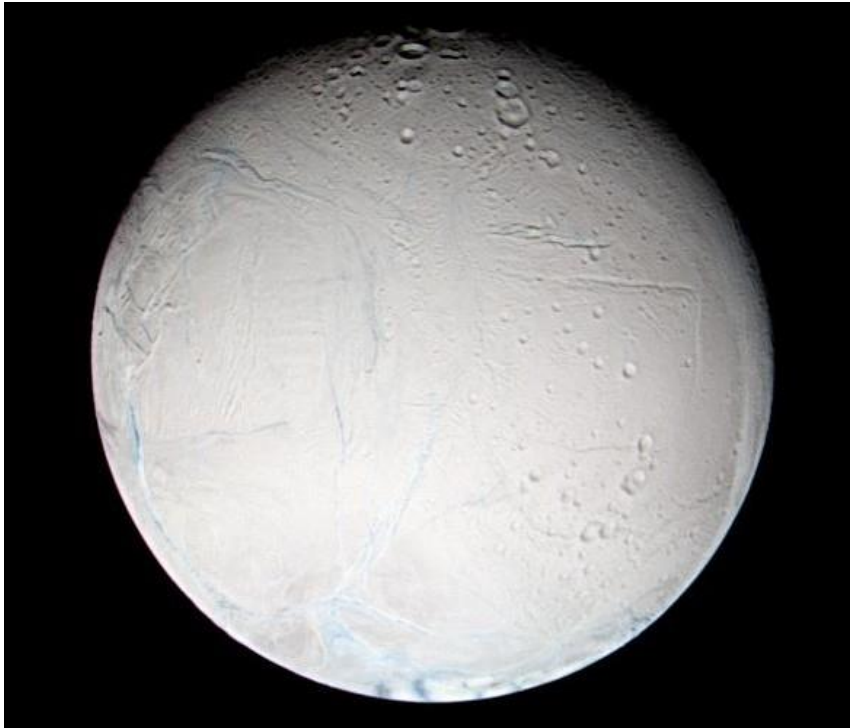
Saturn

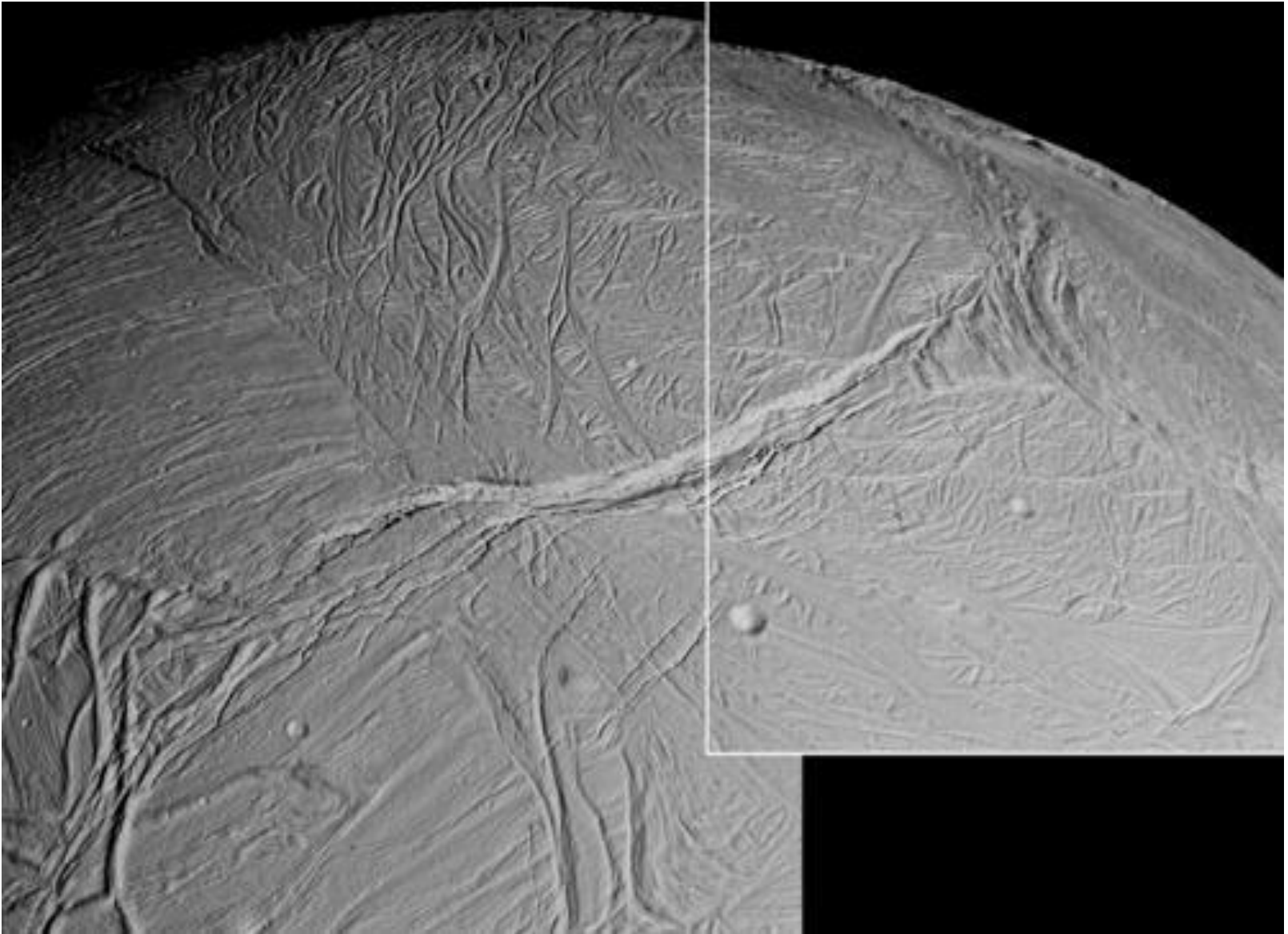
Dust Ring

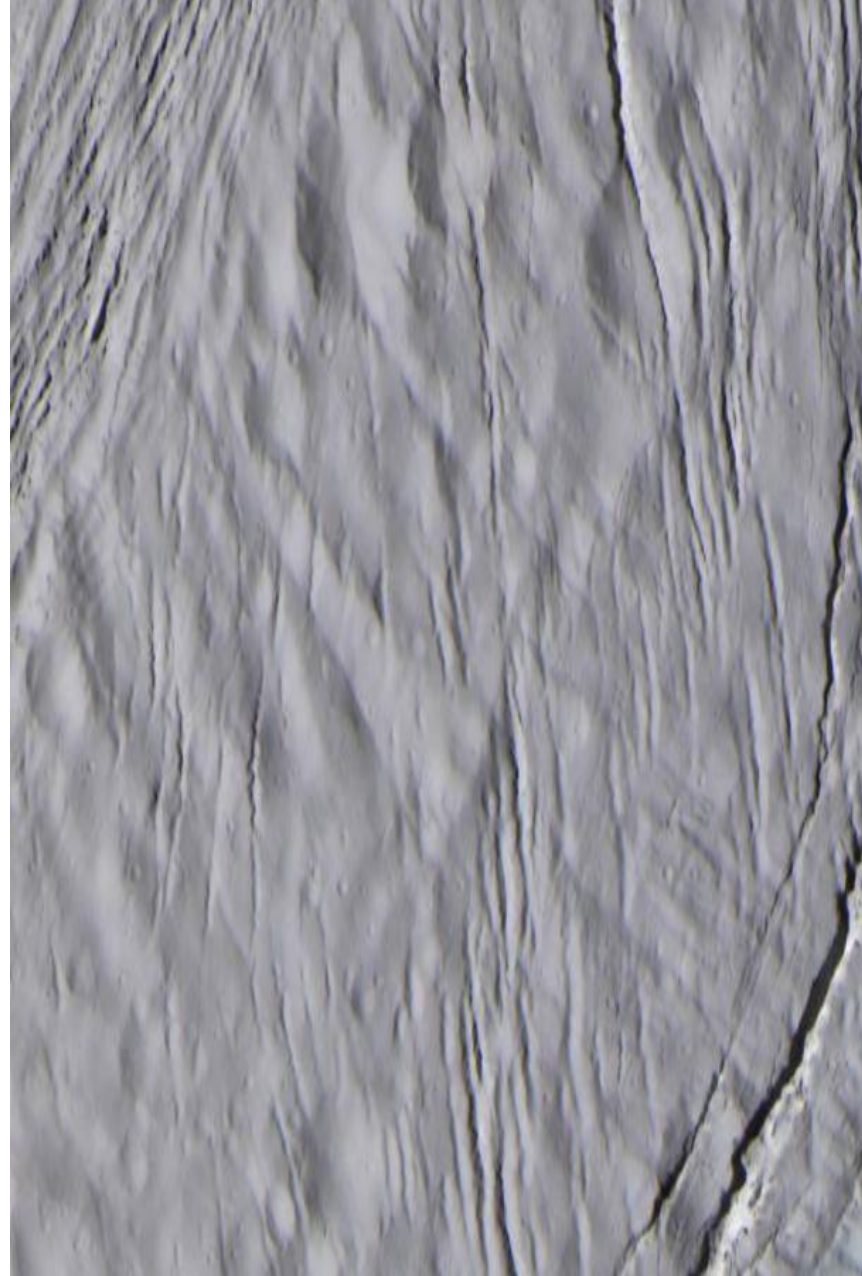
Infrared View of Saturn's Largest Ring
NASA / JPL-Caltech / A. Verbiscer (Univ. of Virginia)

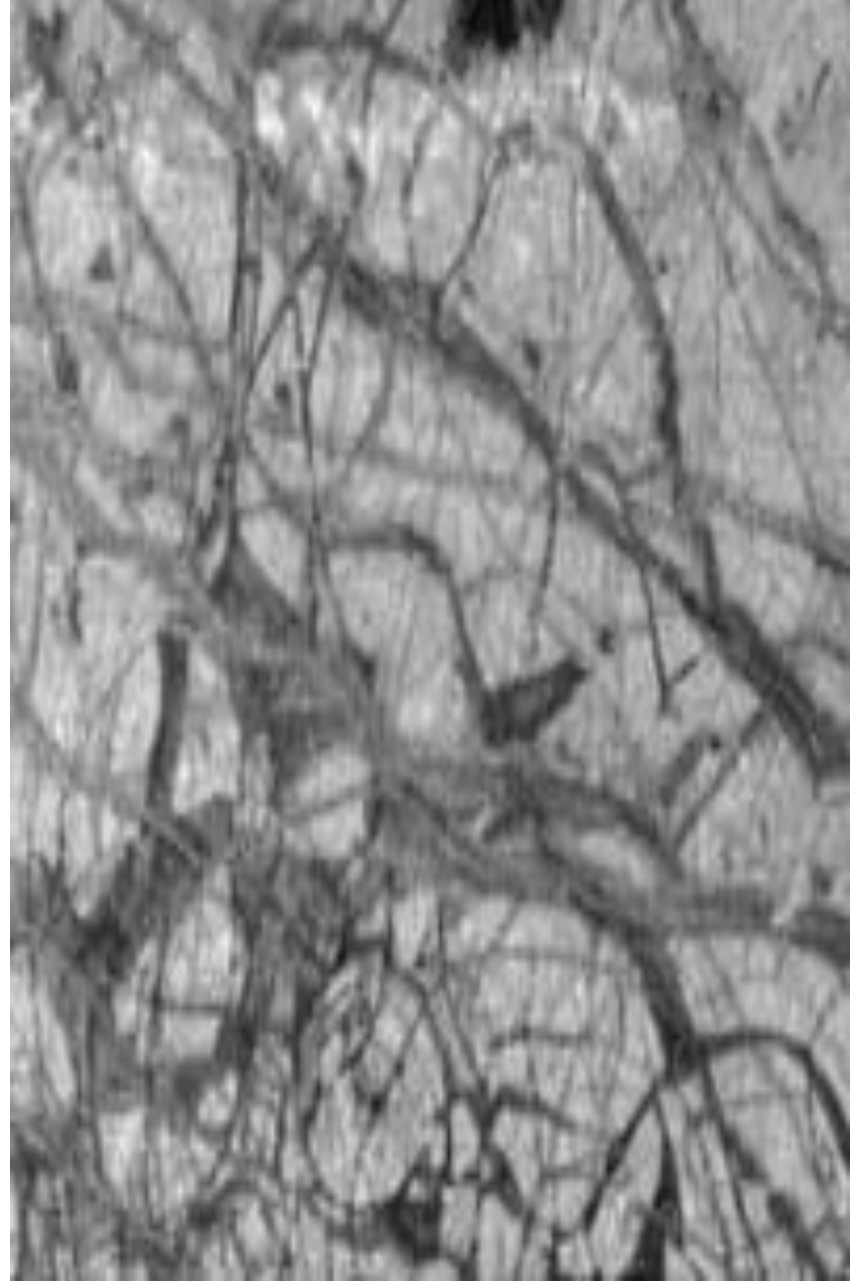
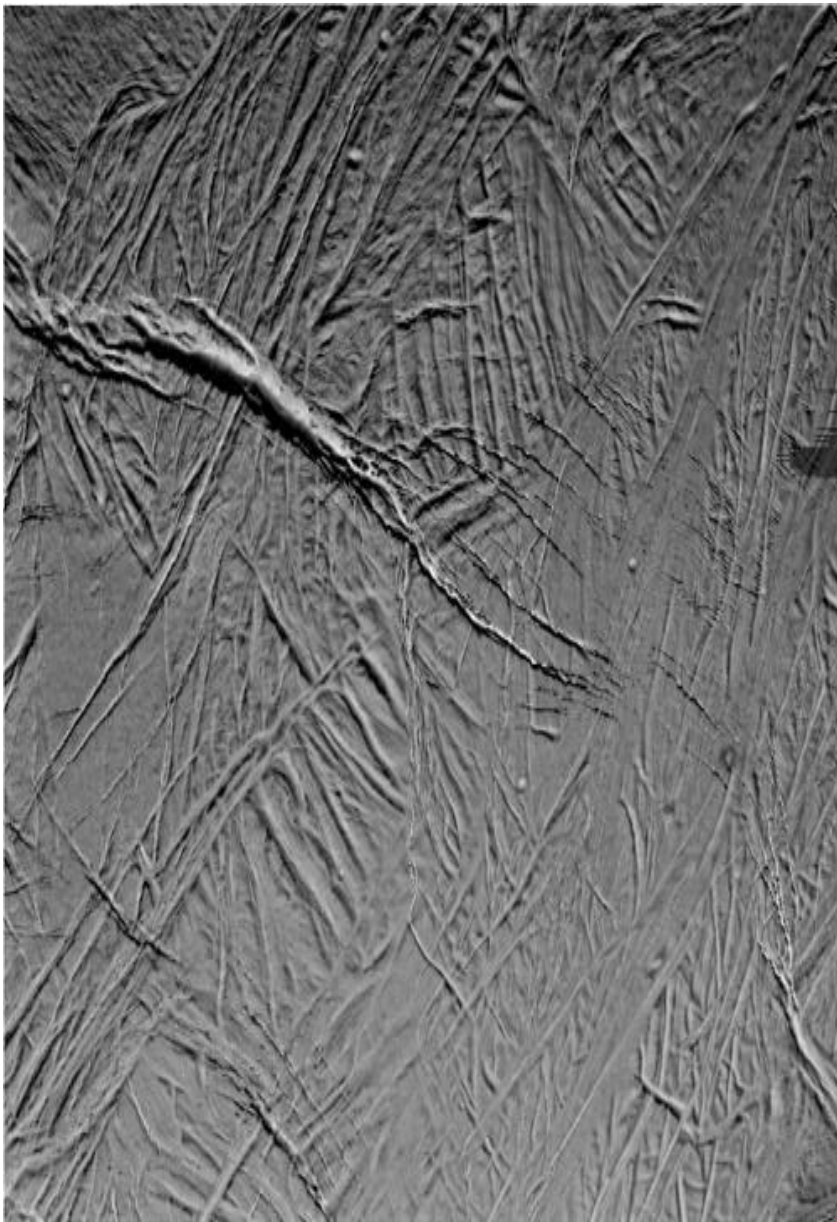
Spitzer Space Telescope • MIPS
ssc2009-19a

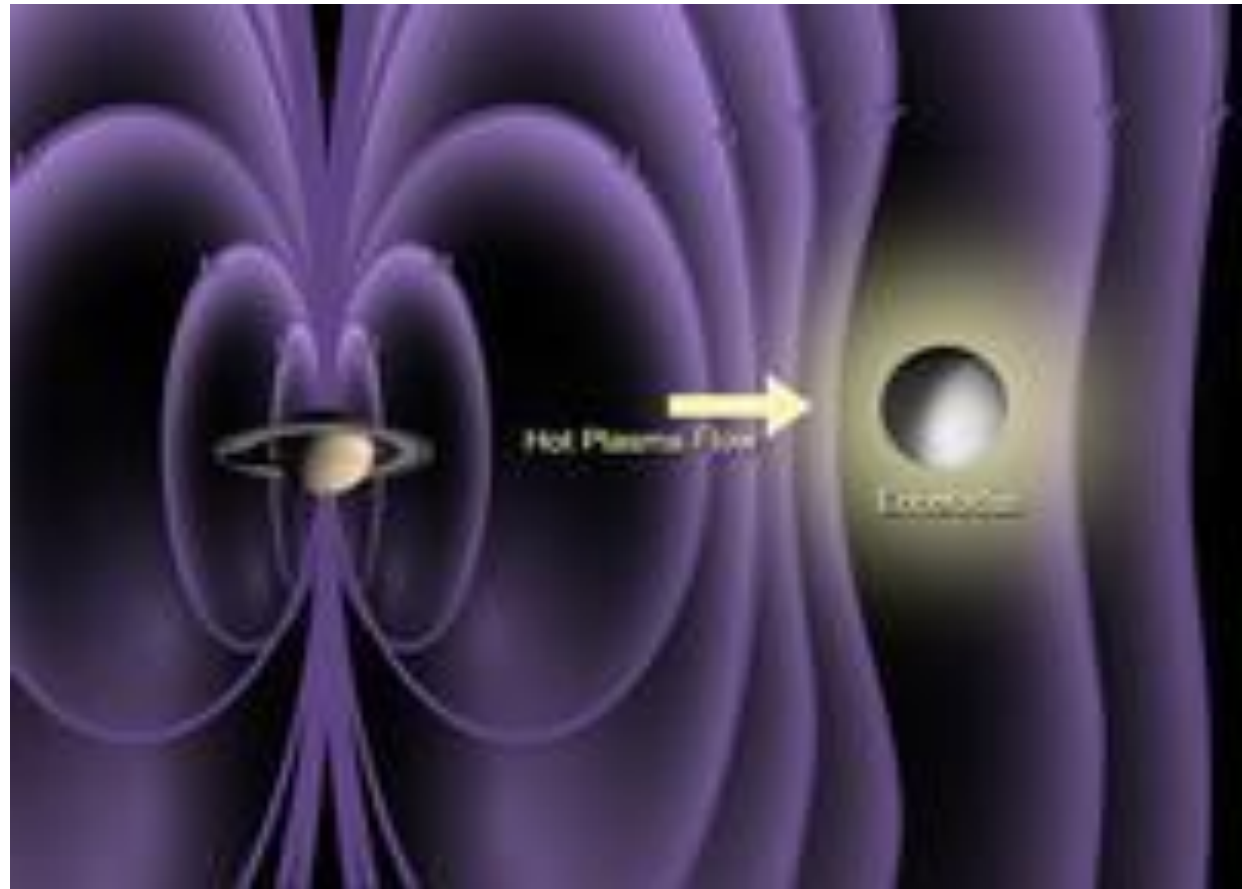












Enceladus "Cold geyser" Model

H₂O vapor plus ice particles

H₂O Ice T = ~77 K

Vent to surface

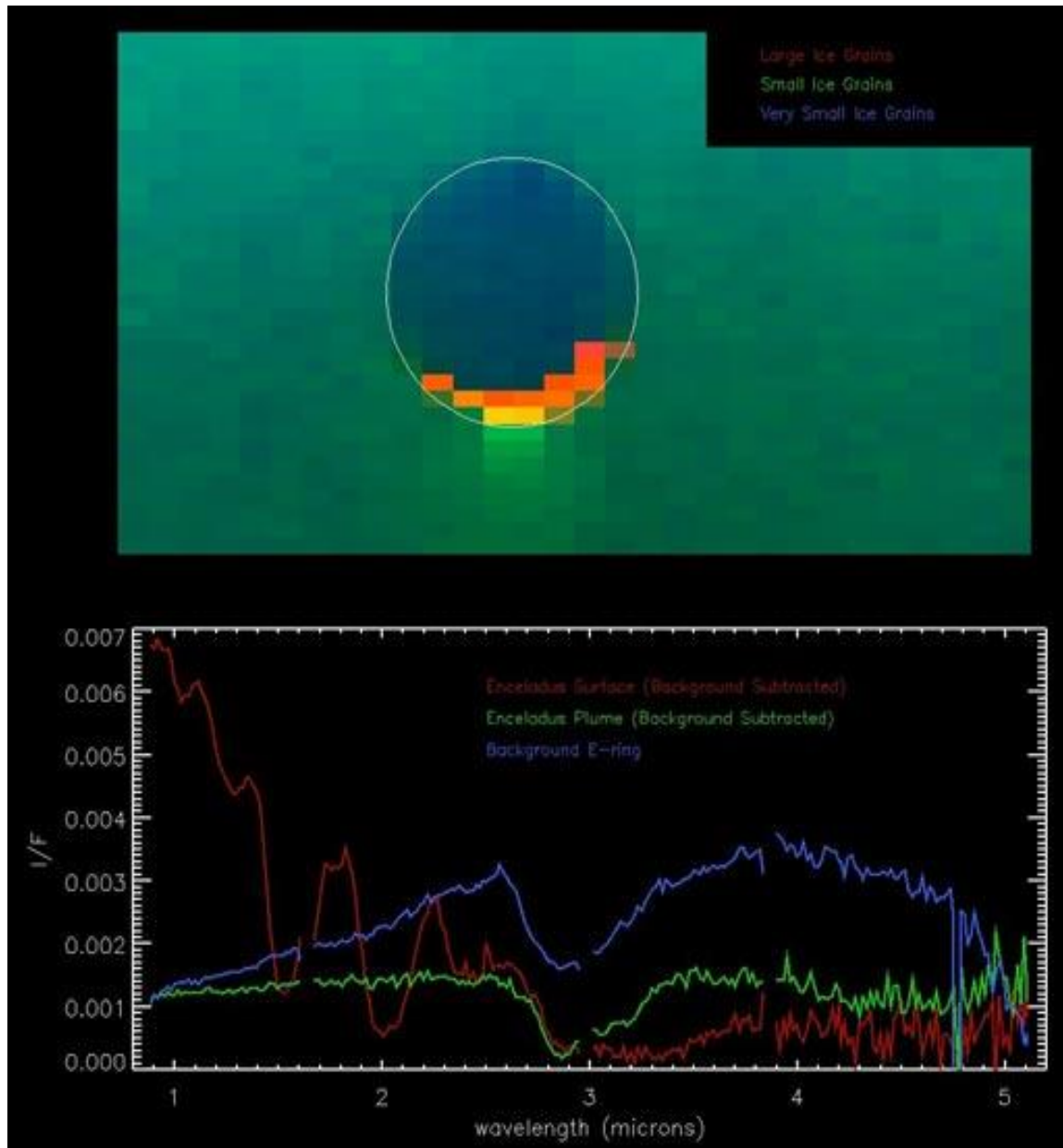
Pressurized Liquid H₂O Pocket T = 273 K

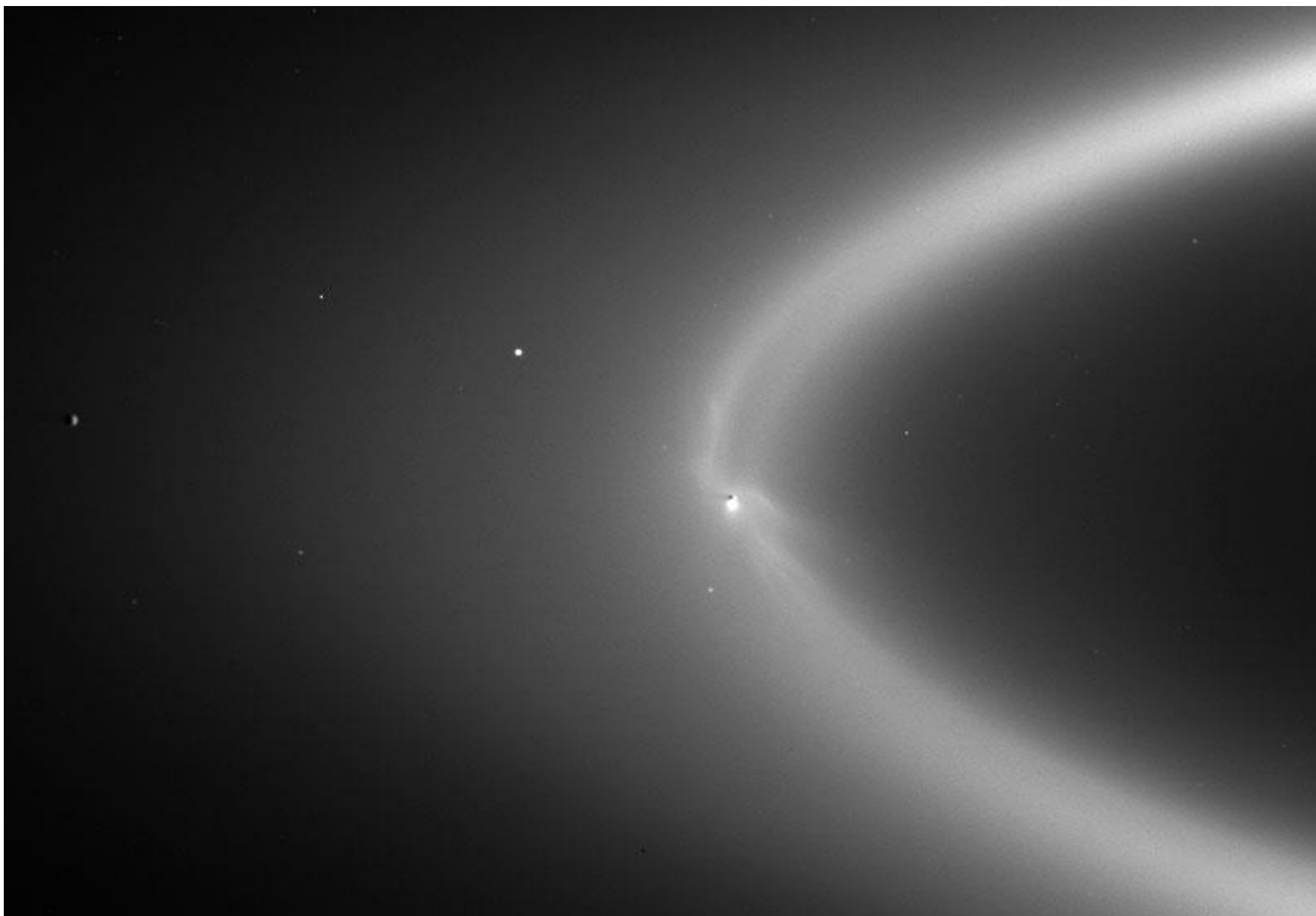
Hydrothermal Circulation
& Convecting Ice

Tidal Heating

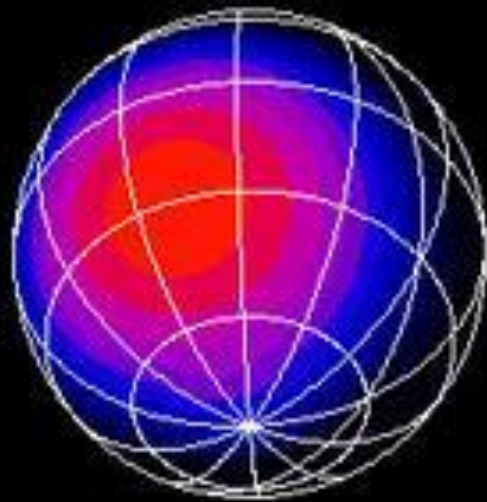
Hot Rock

Tidal Heating

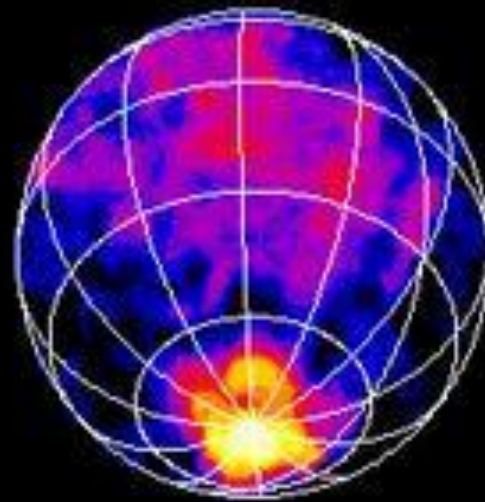




Enceladus Temperature Map

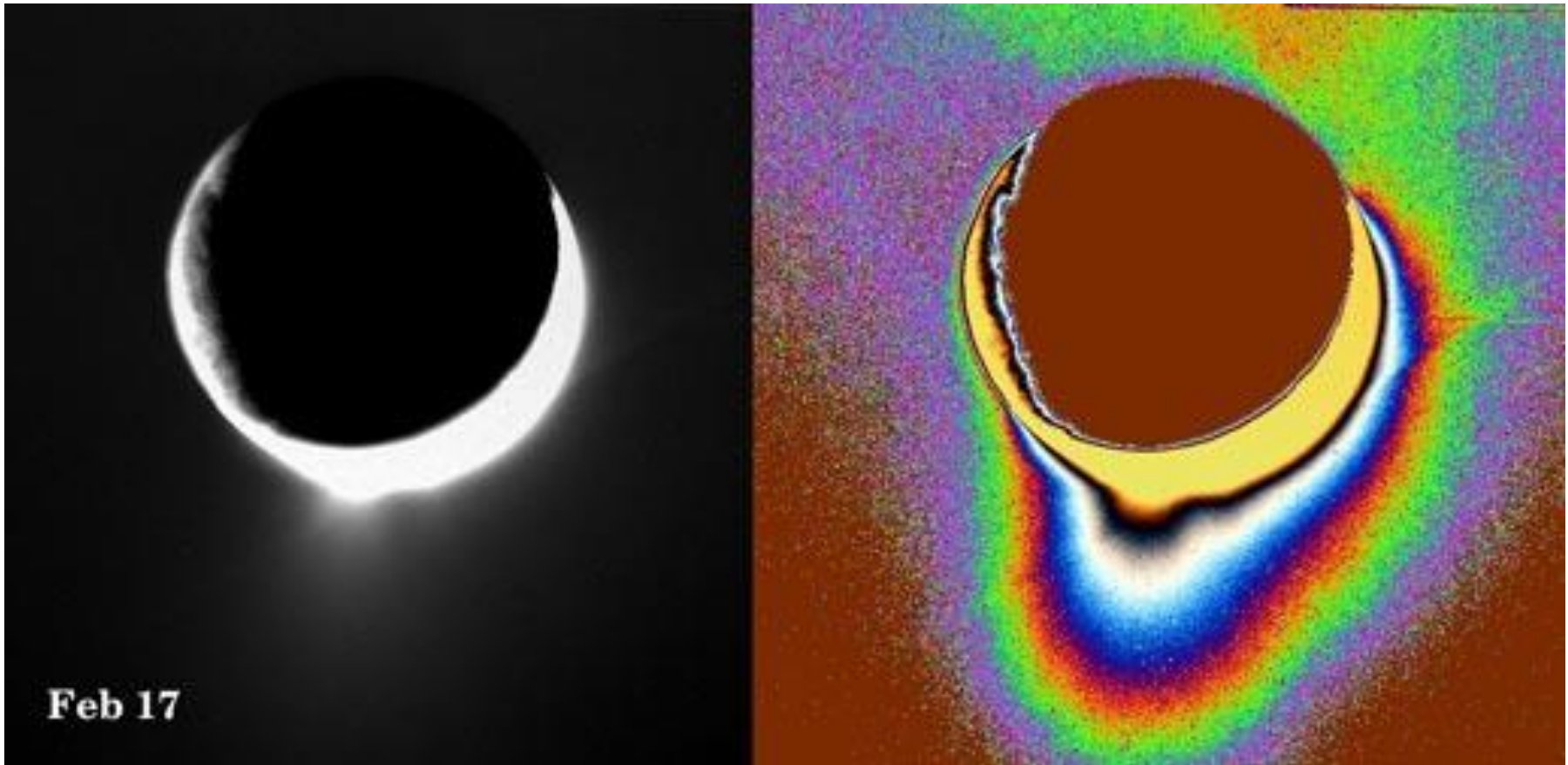


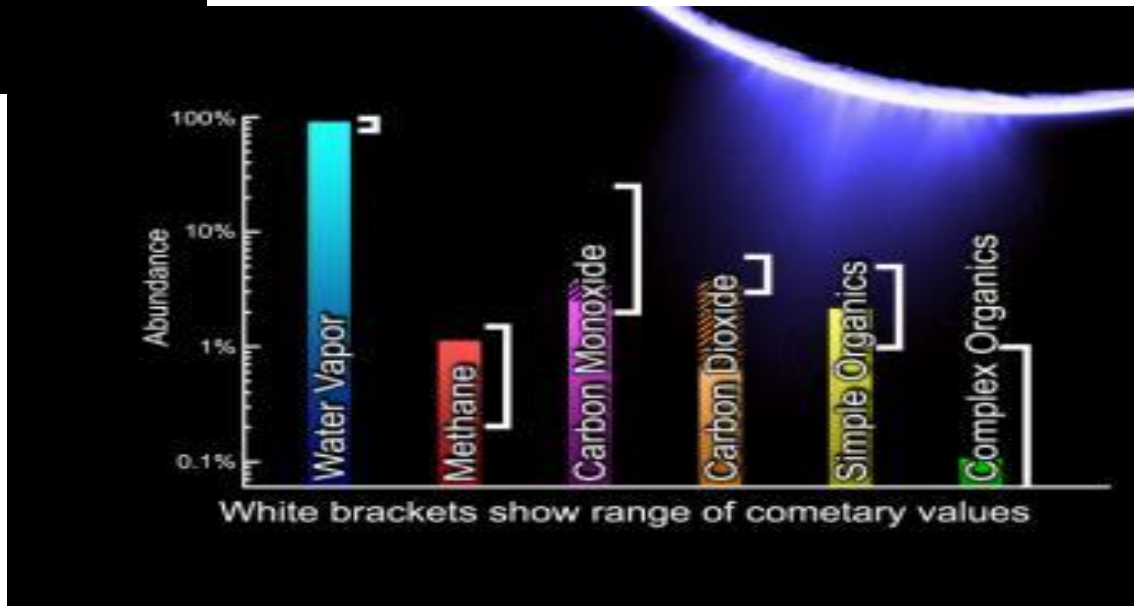
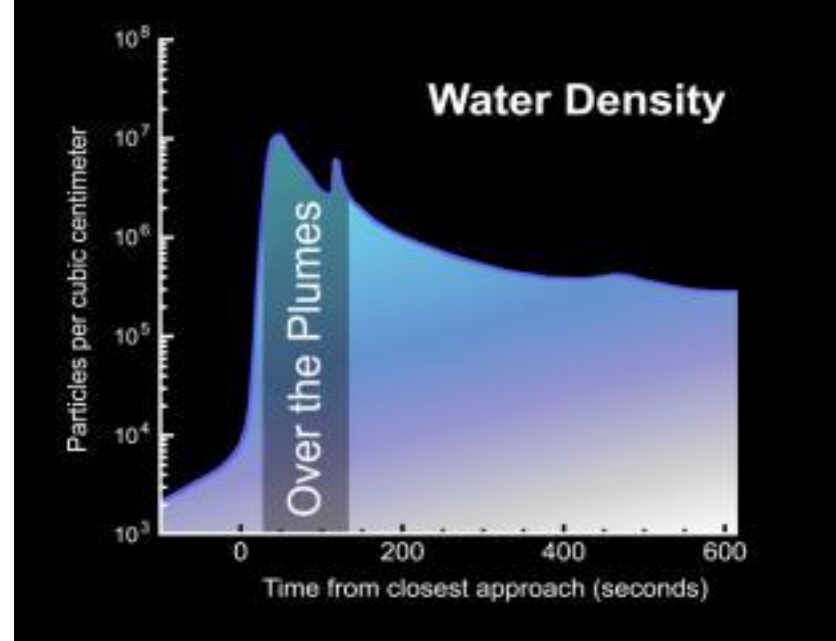
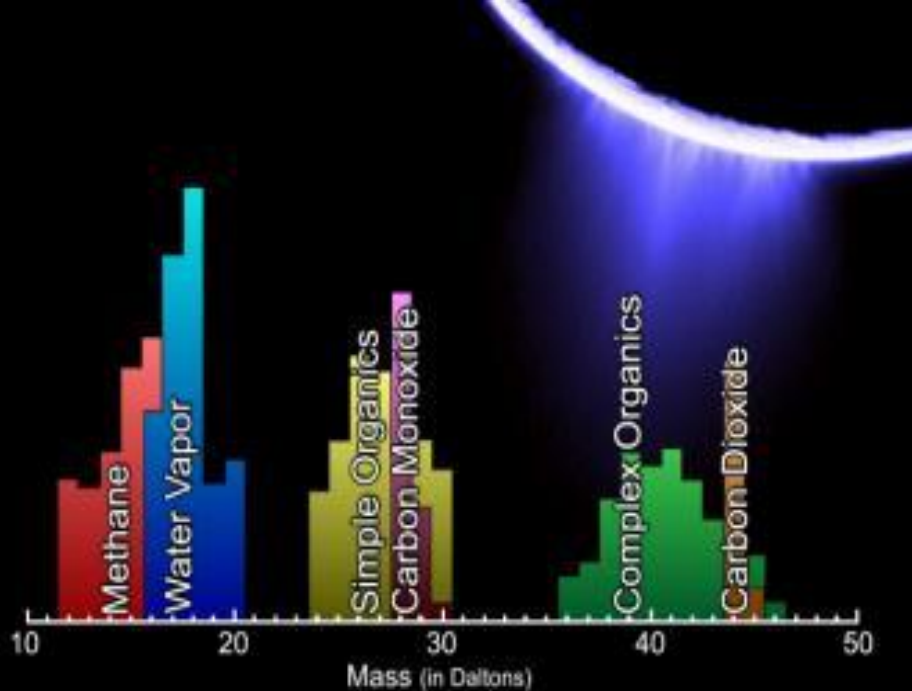
Predicted
Temperatures



Observed
Temperatures

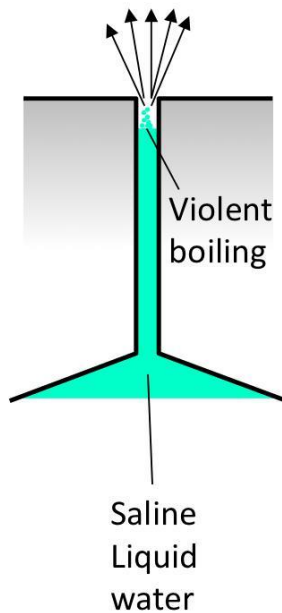




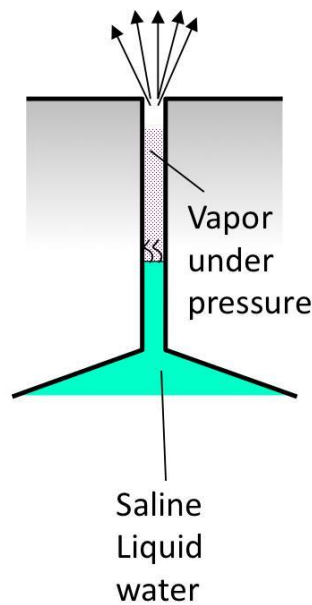


Plume Vent Models

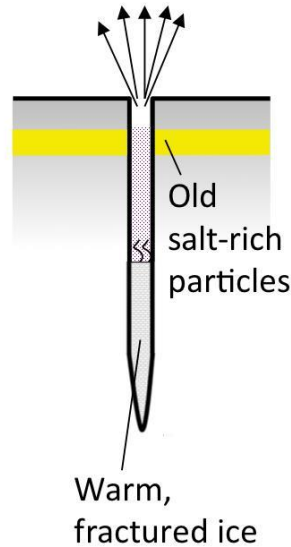
A.
**Near-Surface
Geyser**



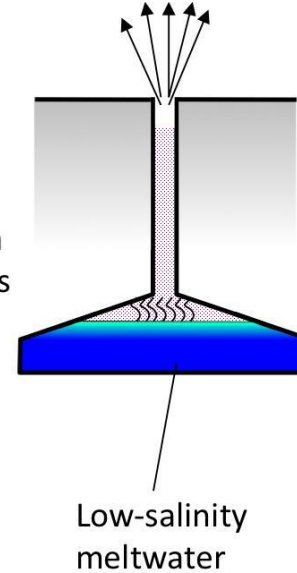
B.
**Evaporation
in a
Narrow
Fissure**



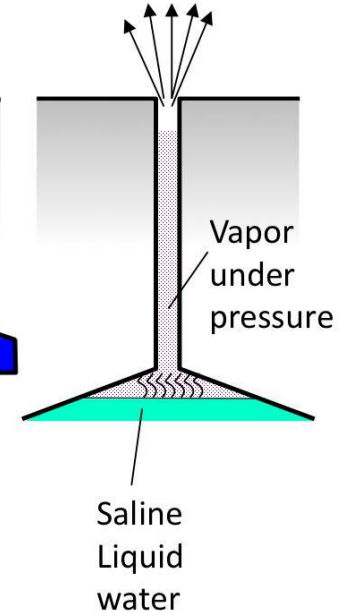
C.
**Solid-State
Sublimation**

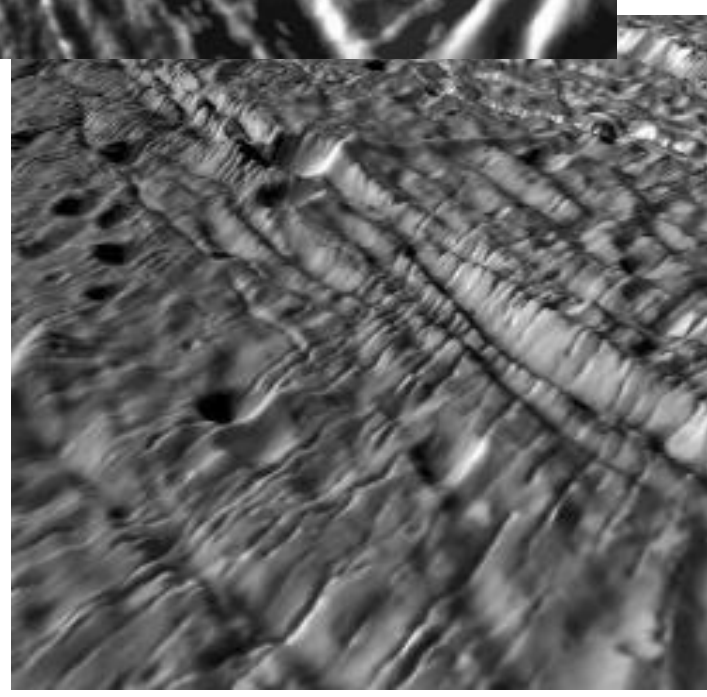
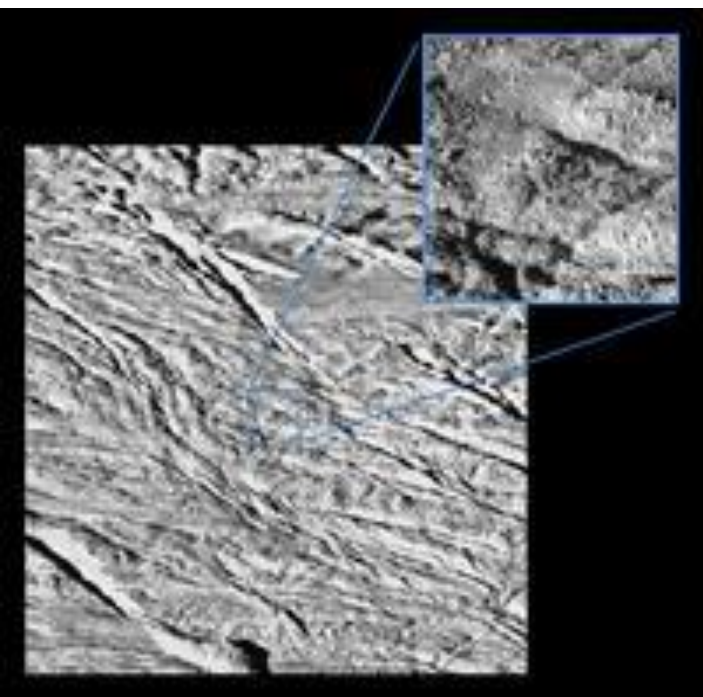
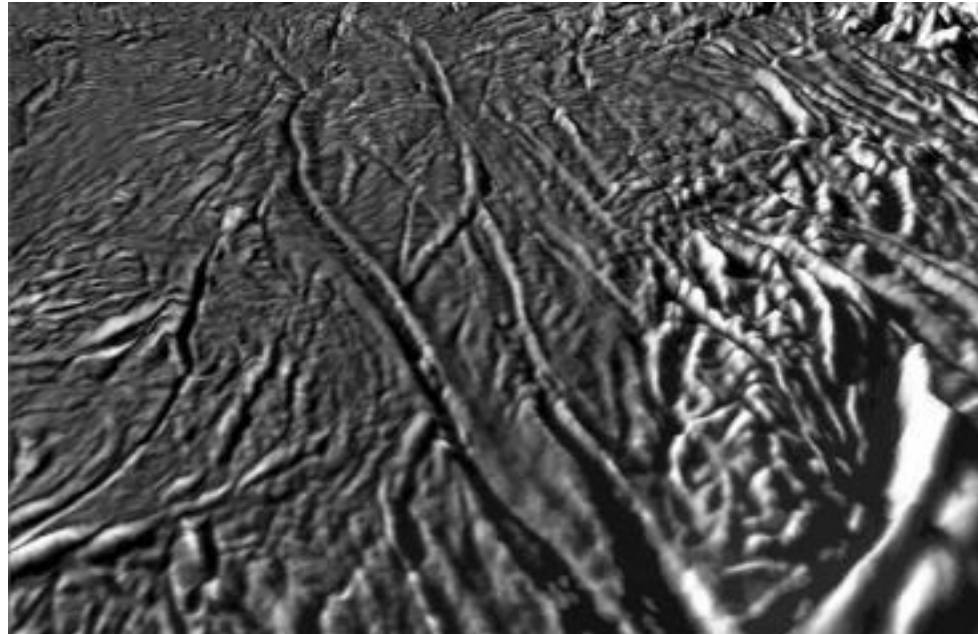
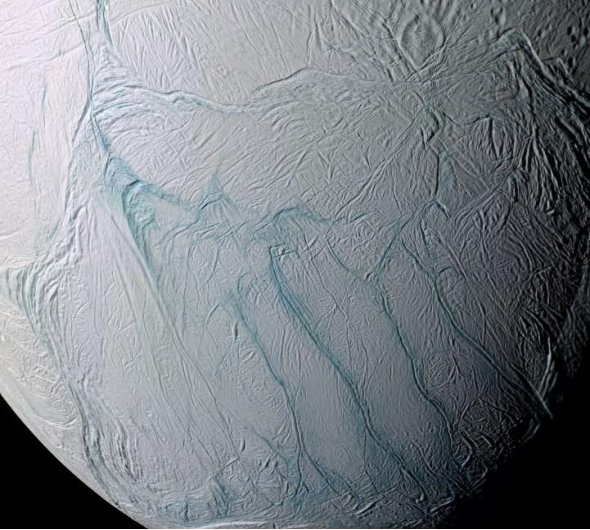


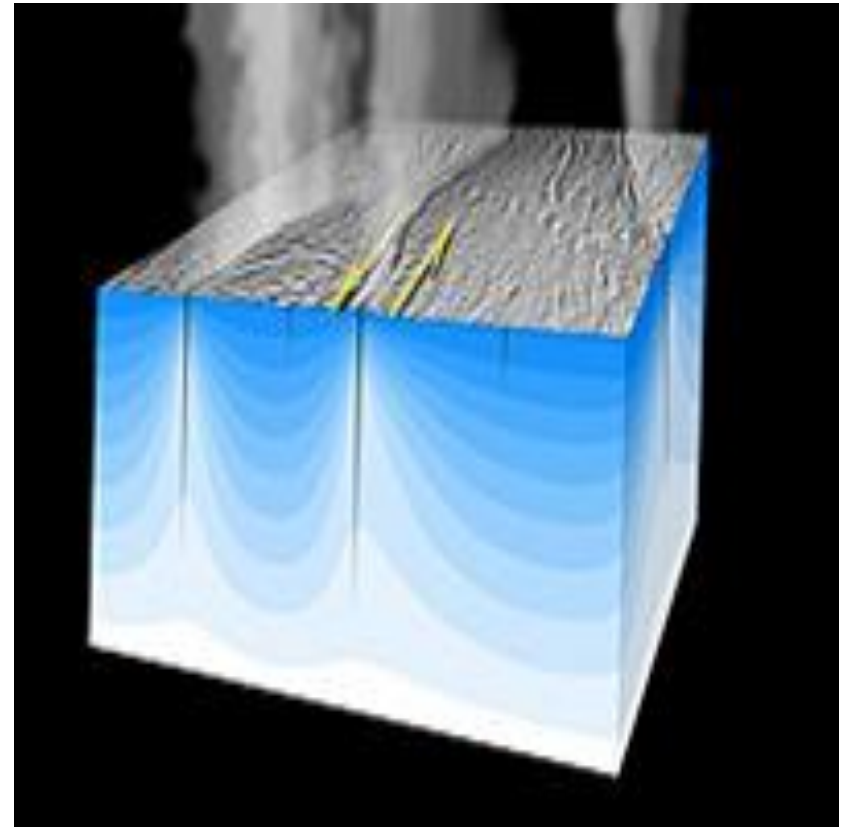
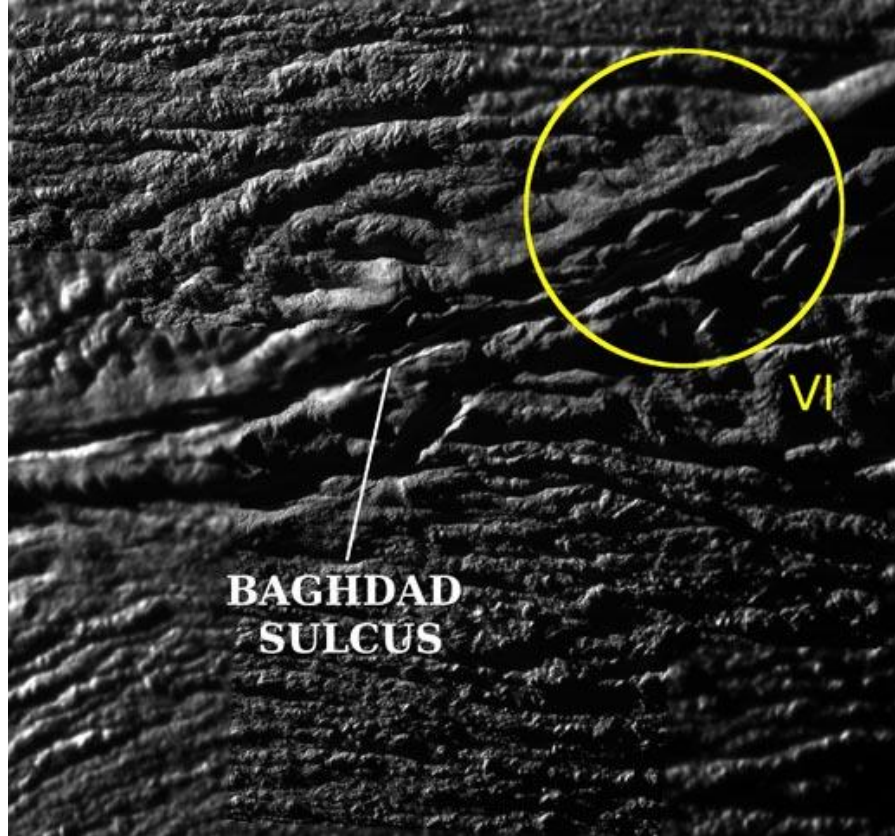
D.
**Salt-Poor
Meltwater**

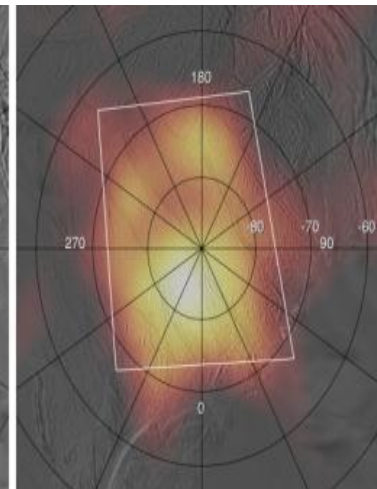
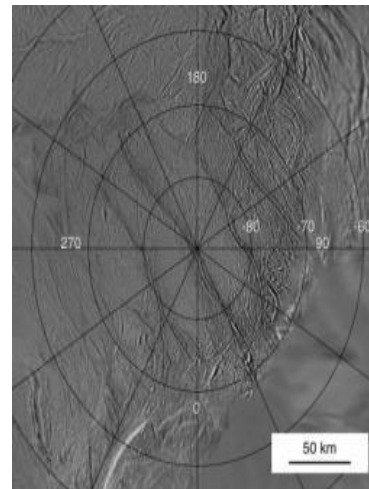
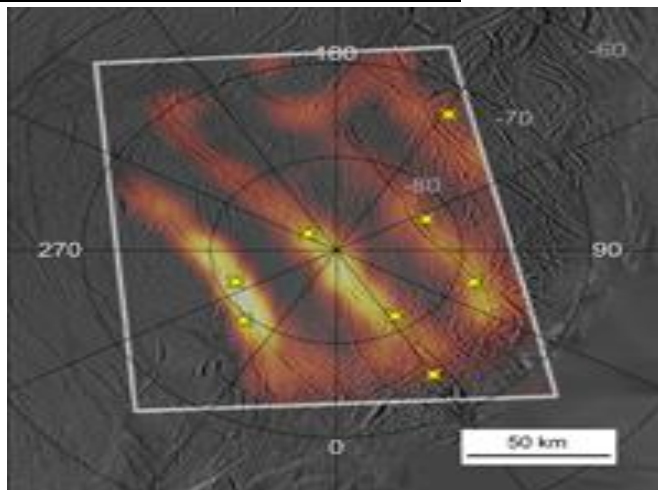
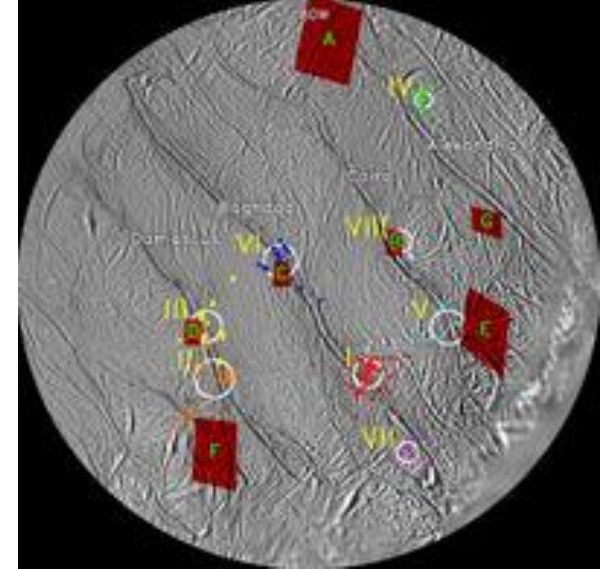
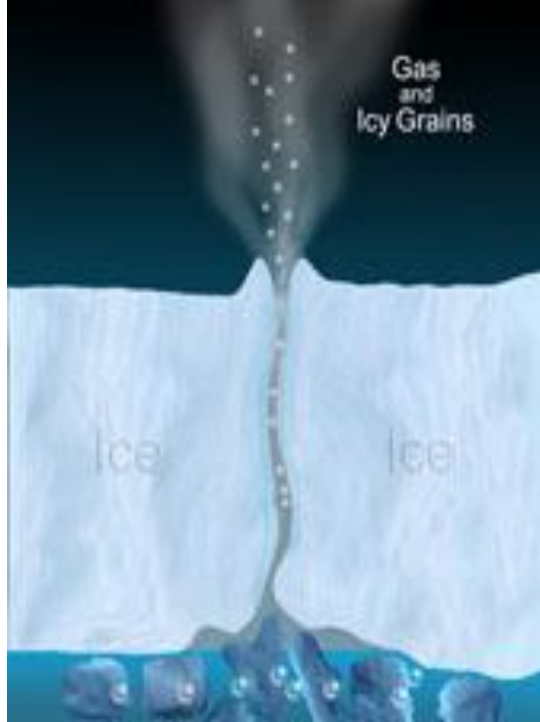
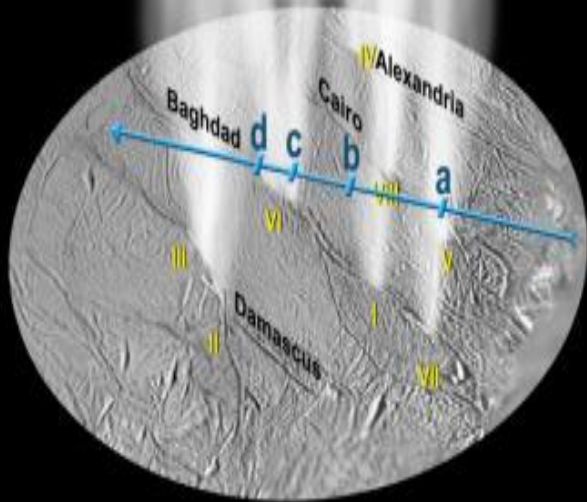


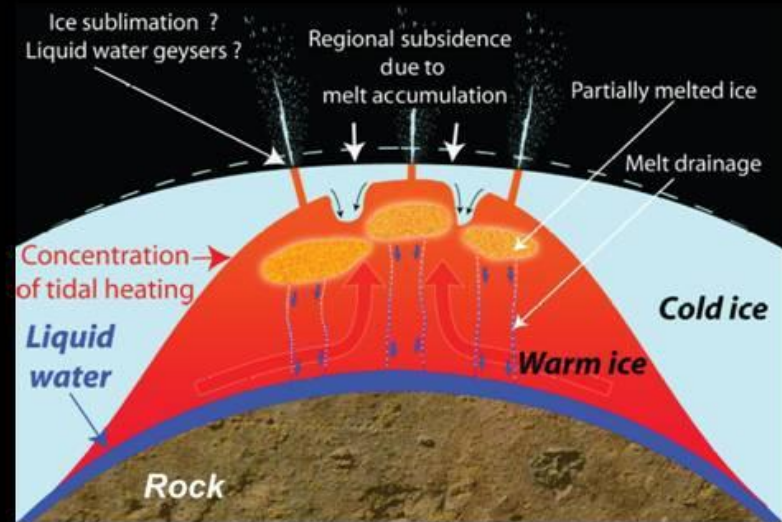
E.
**Pressurized
Saltwater
Chamber**

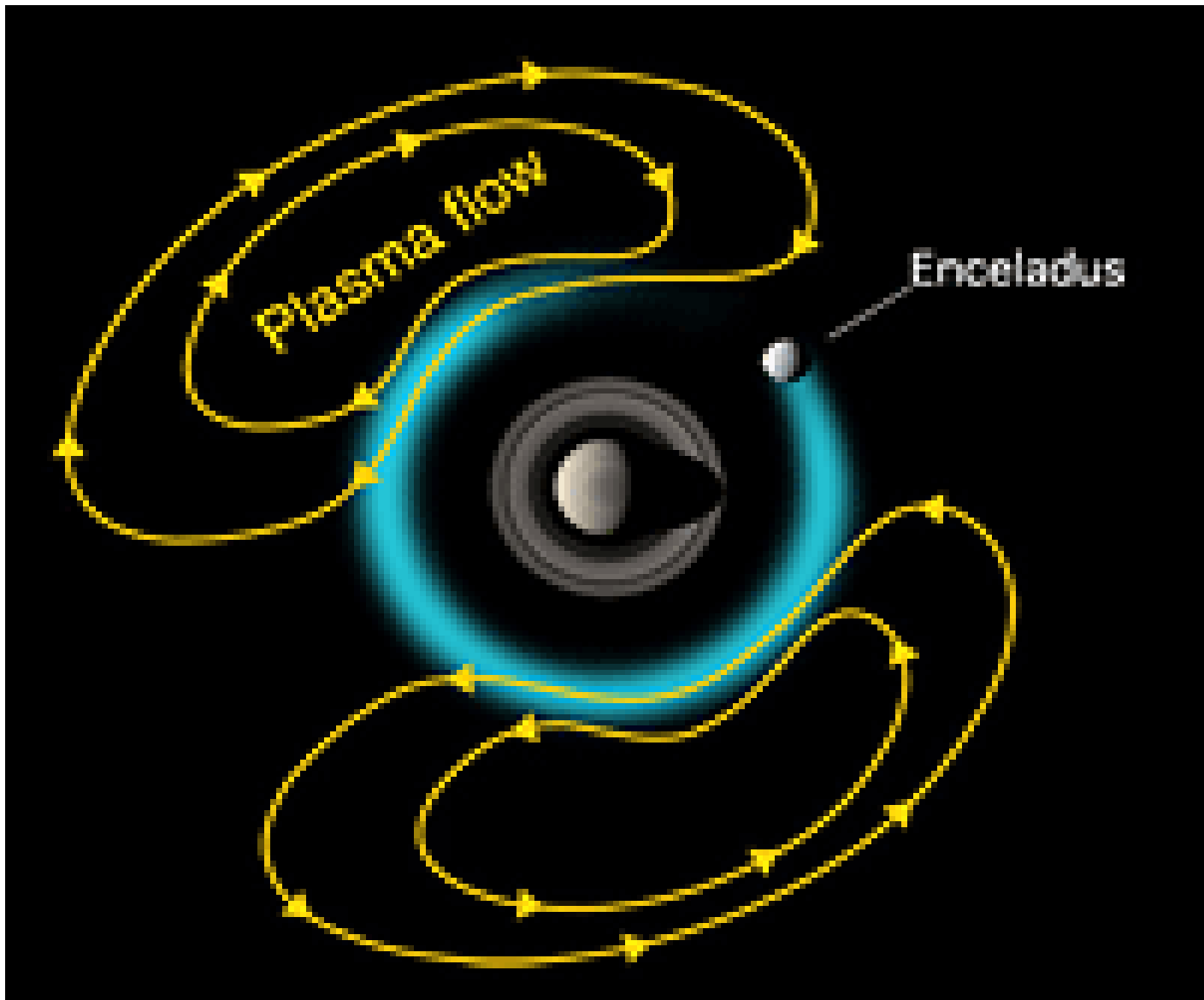


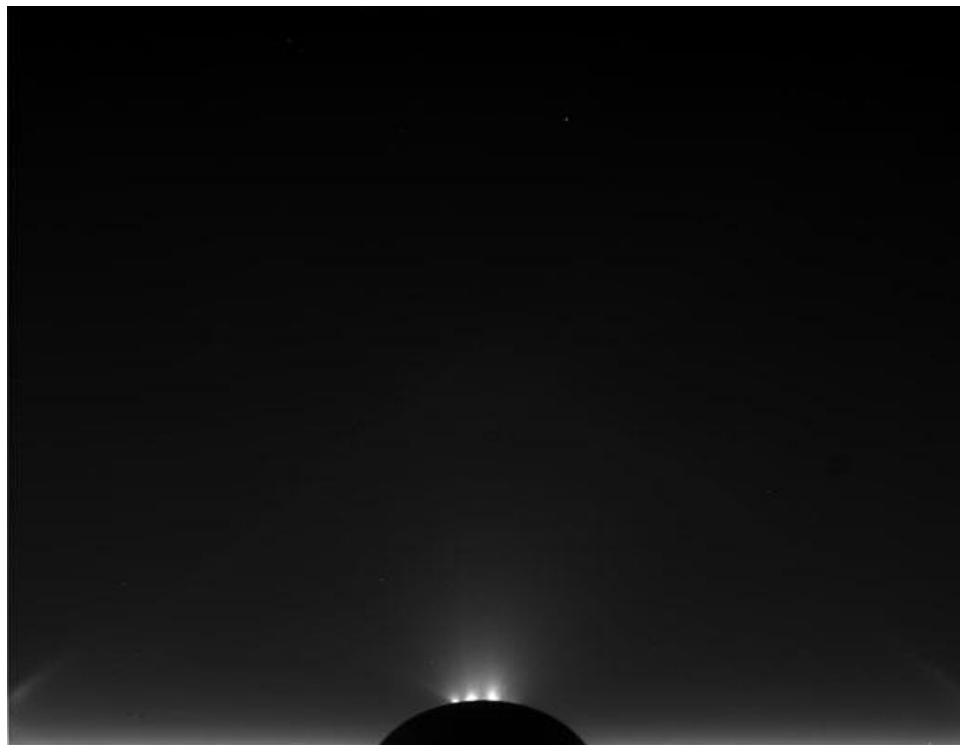
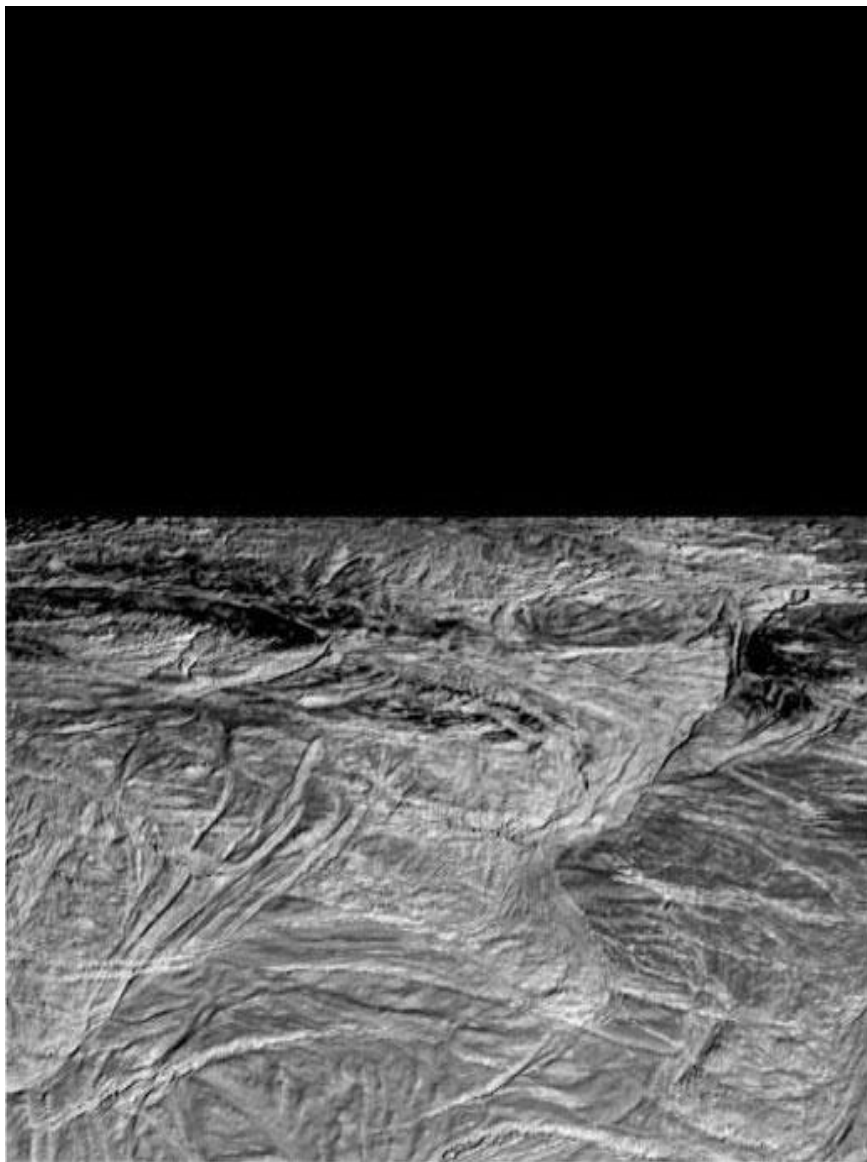


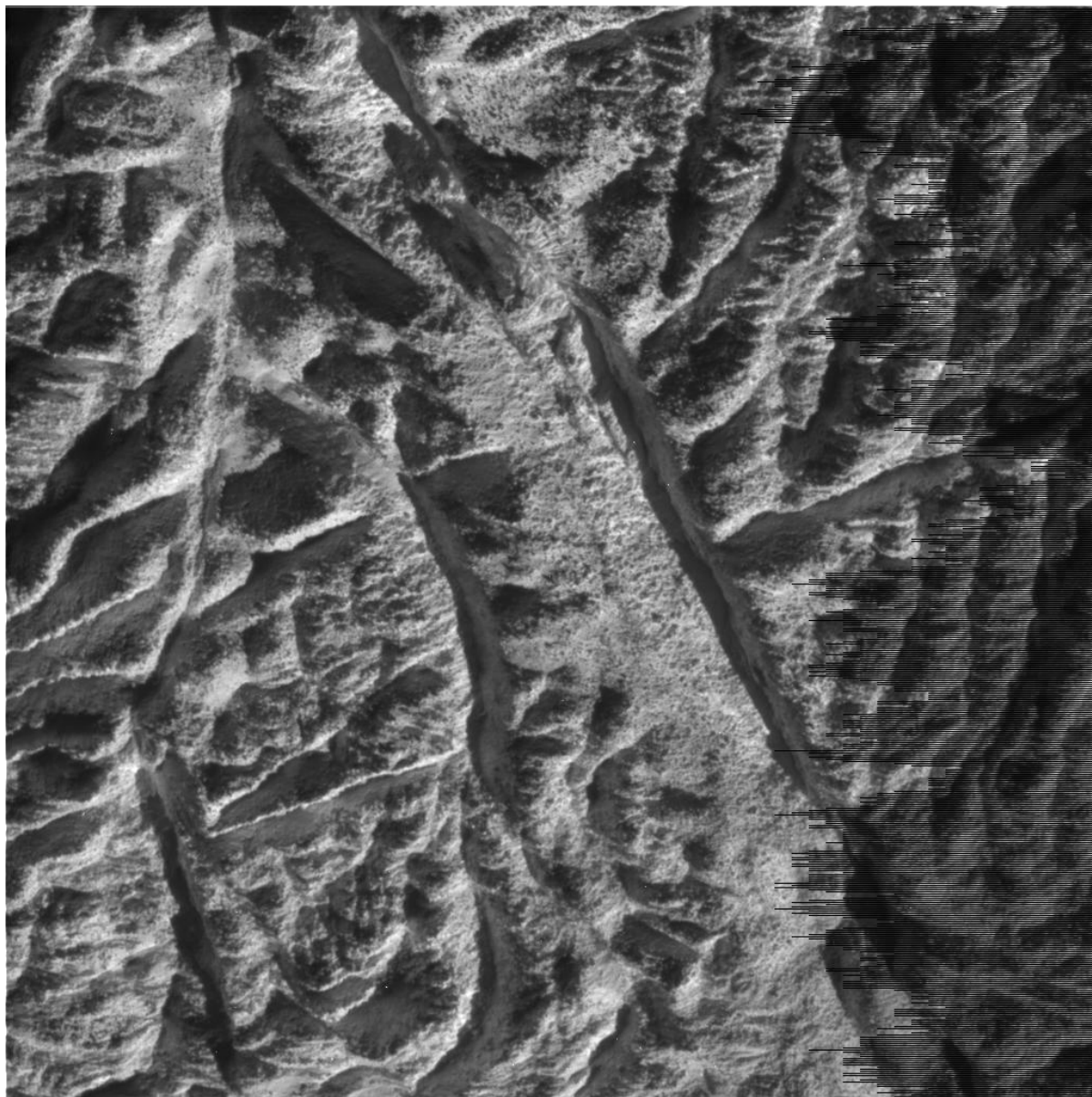


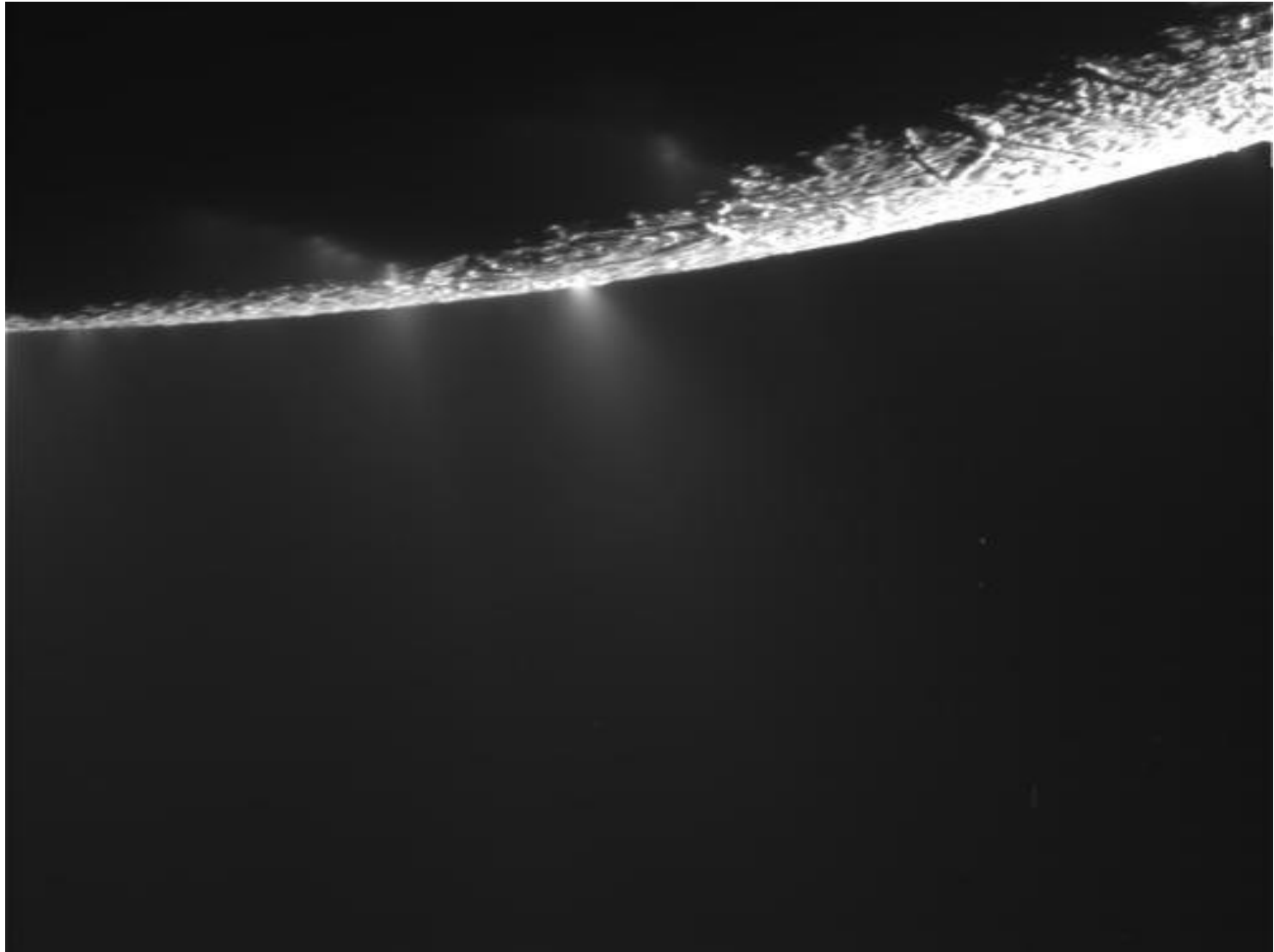




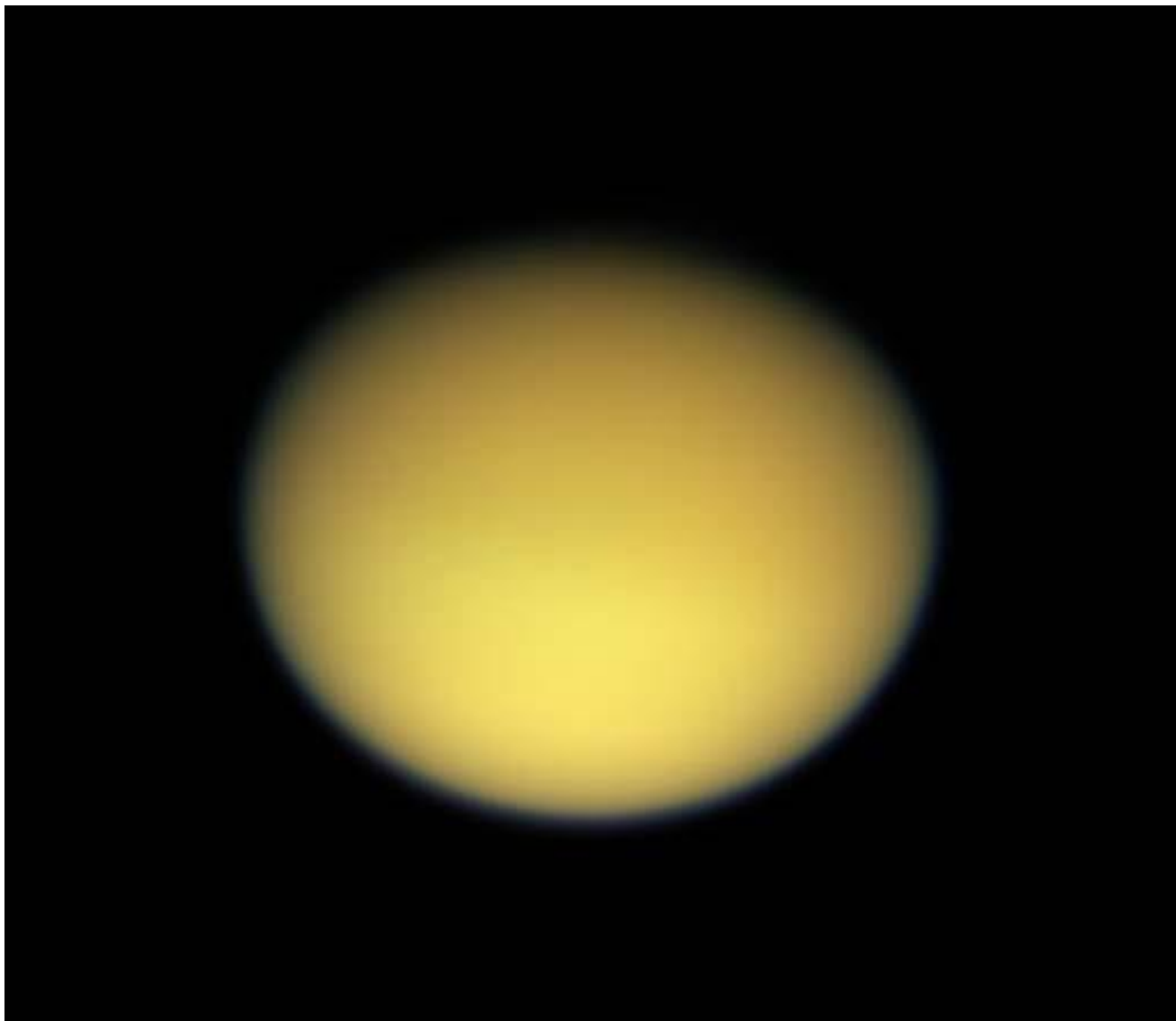


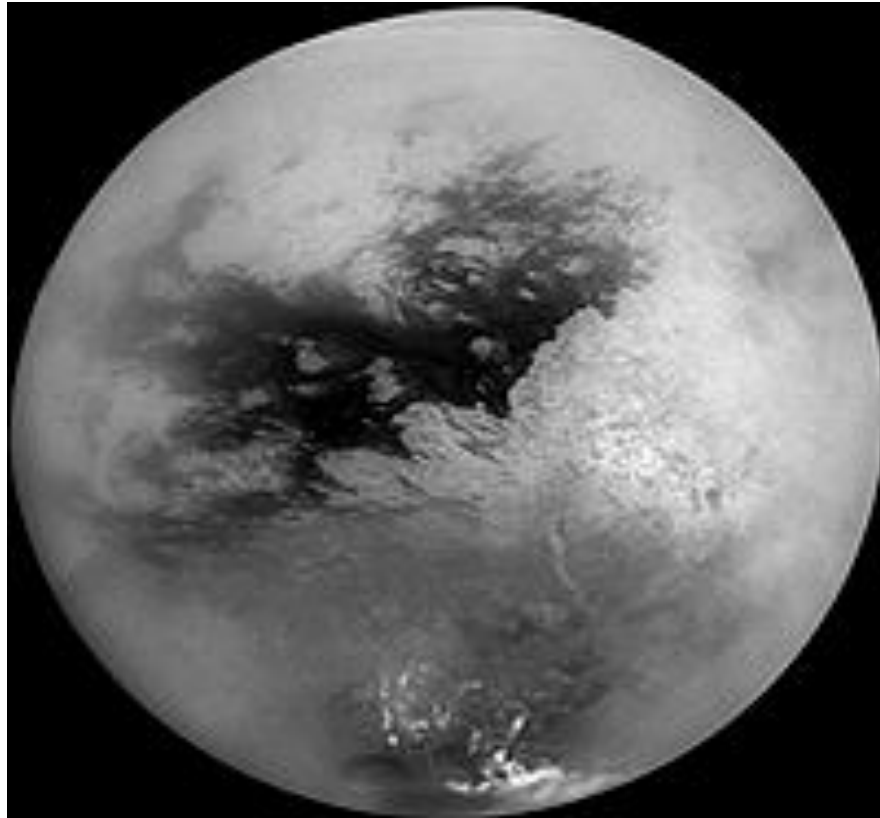


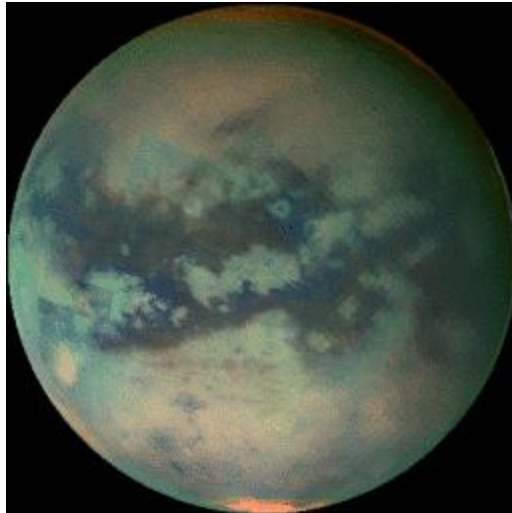


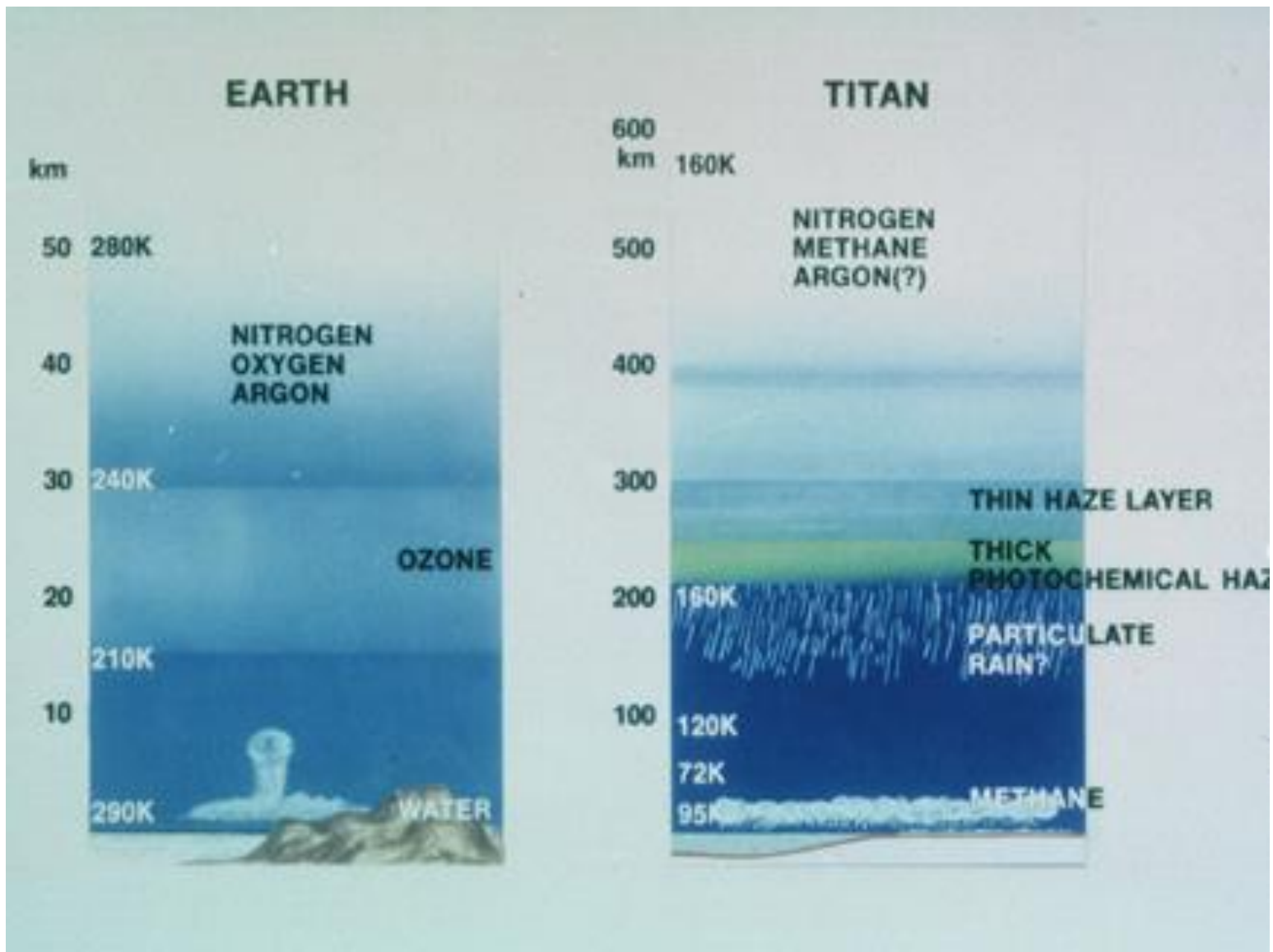


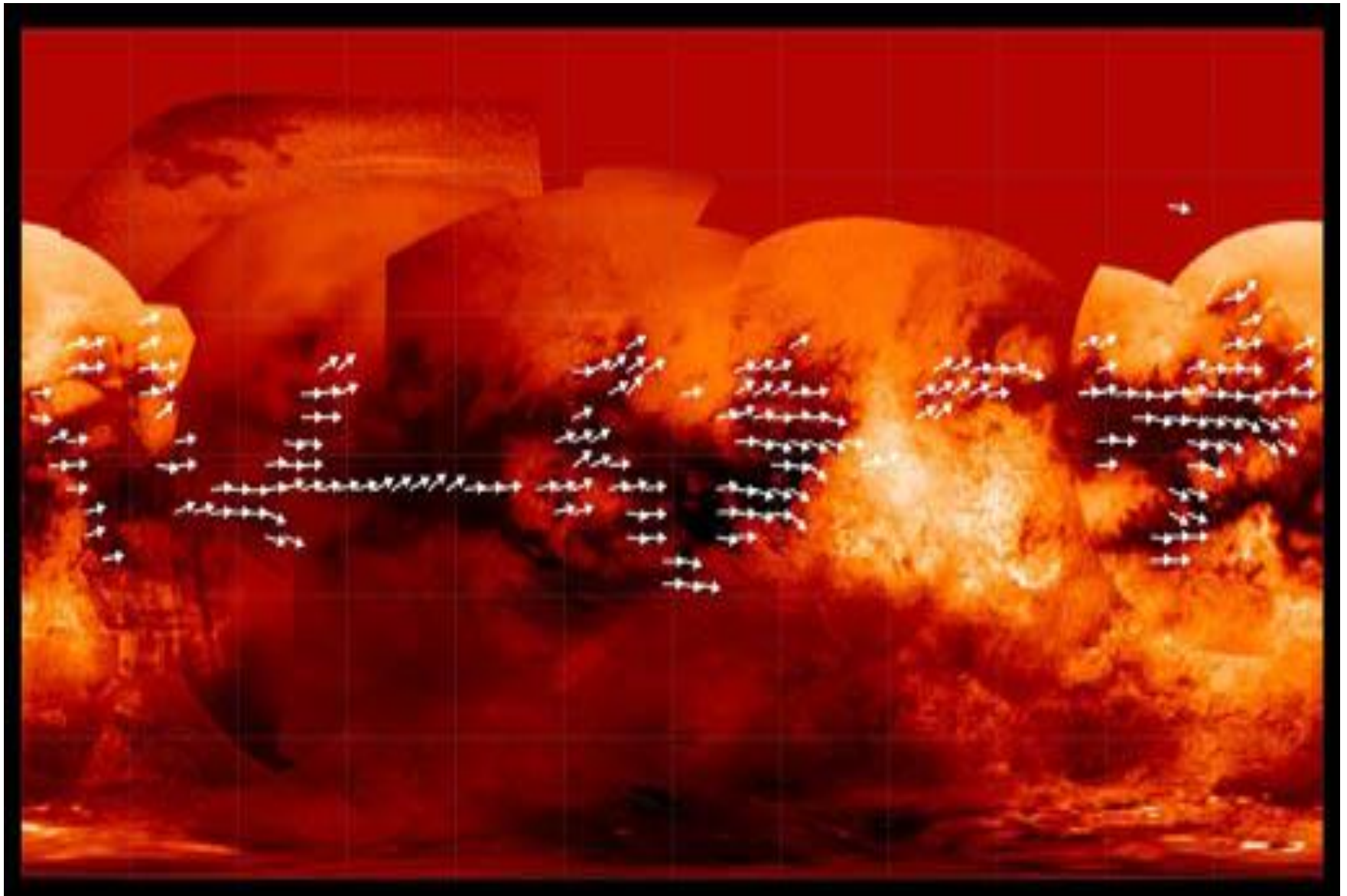


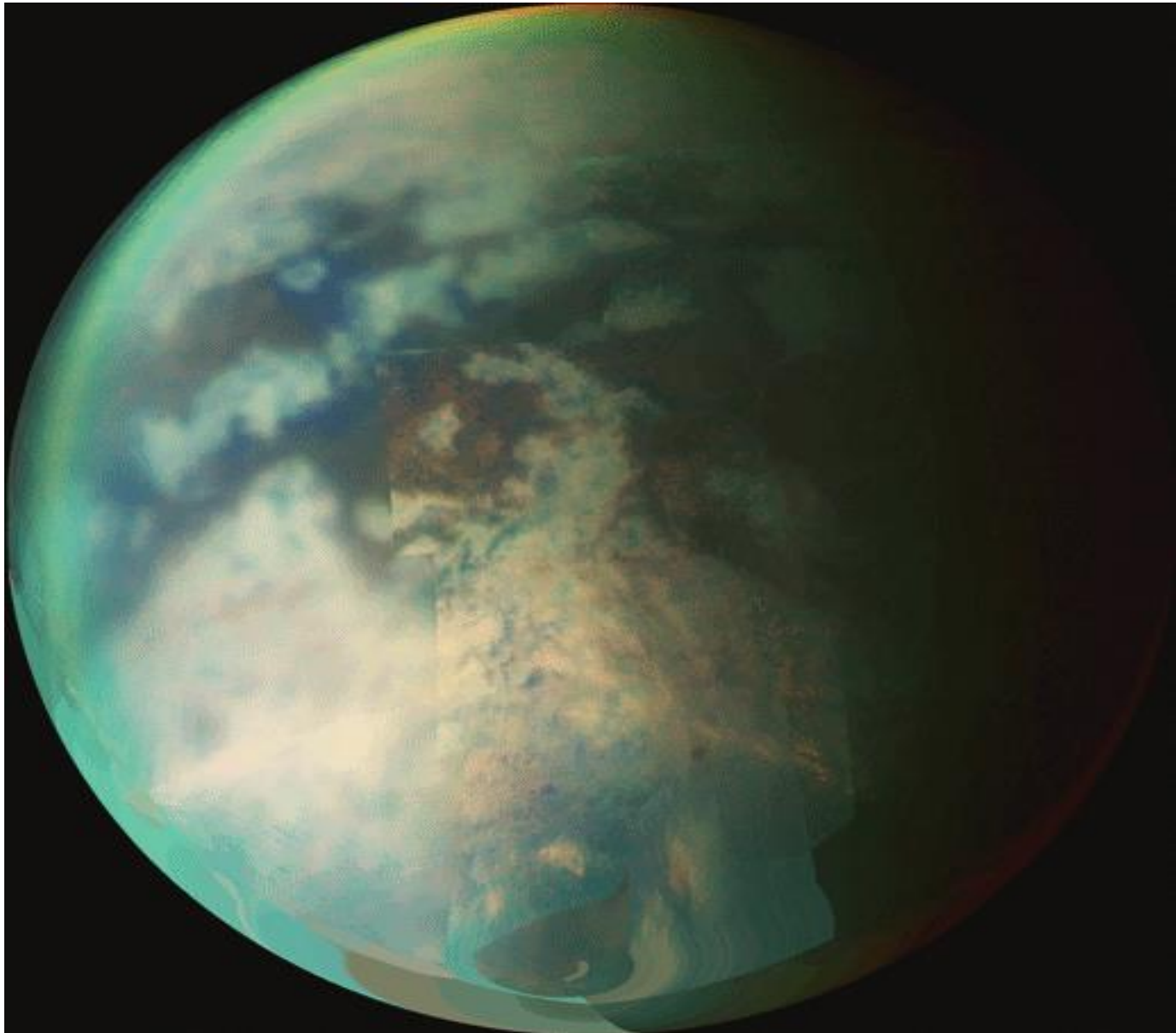


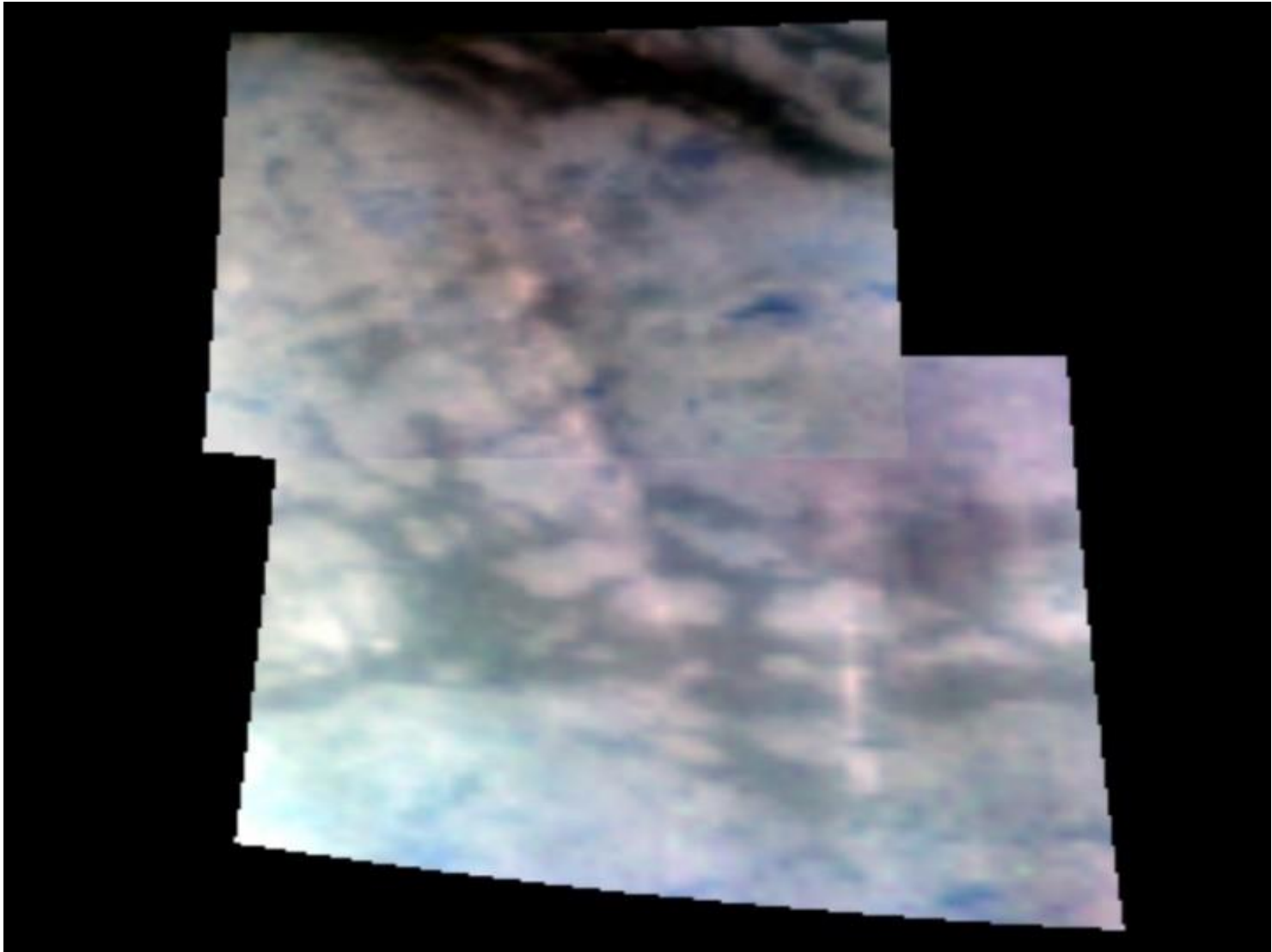


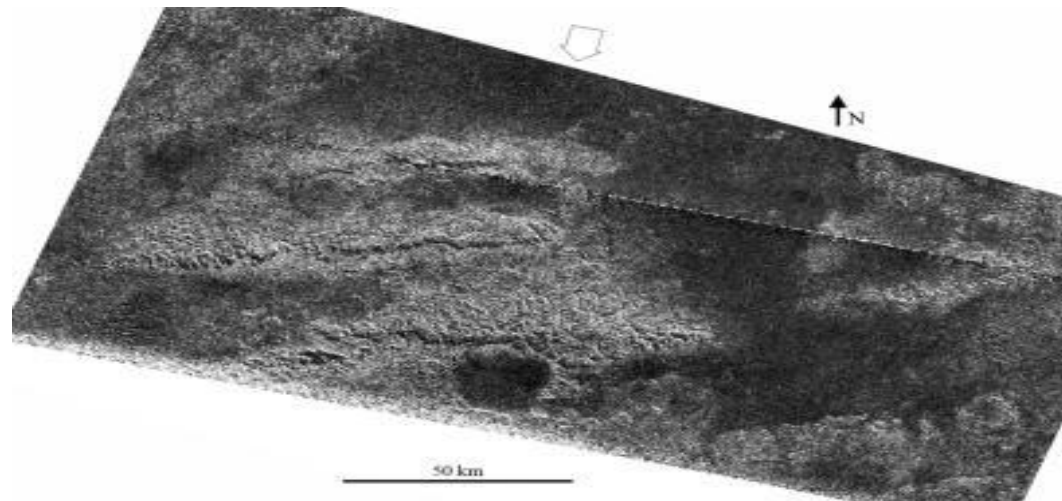
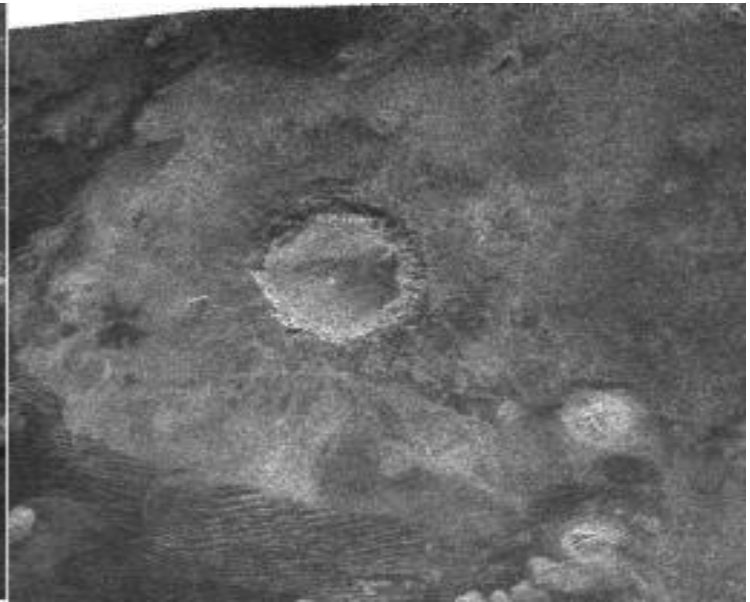


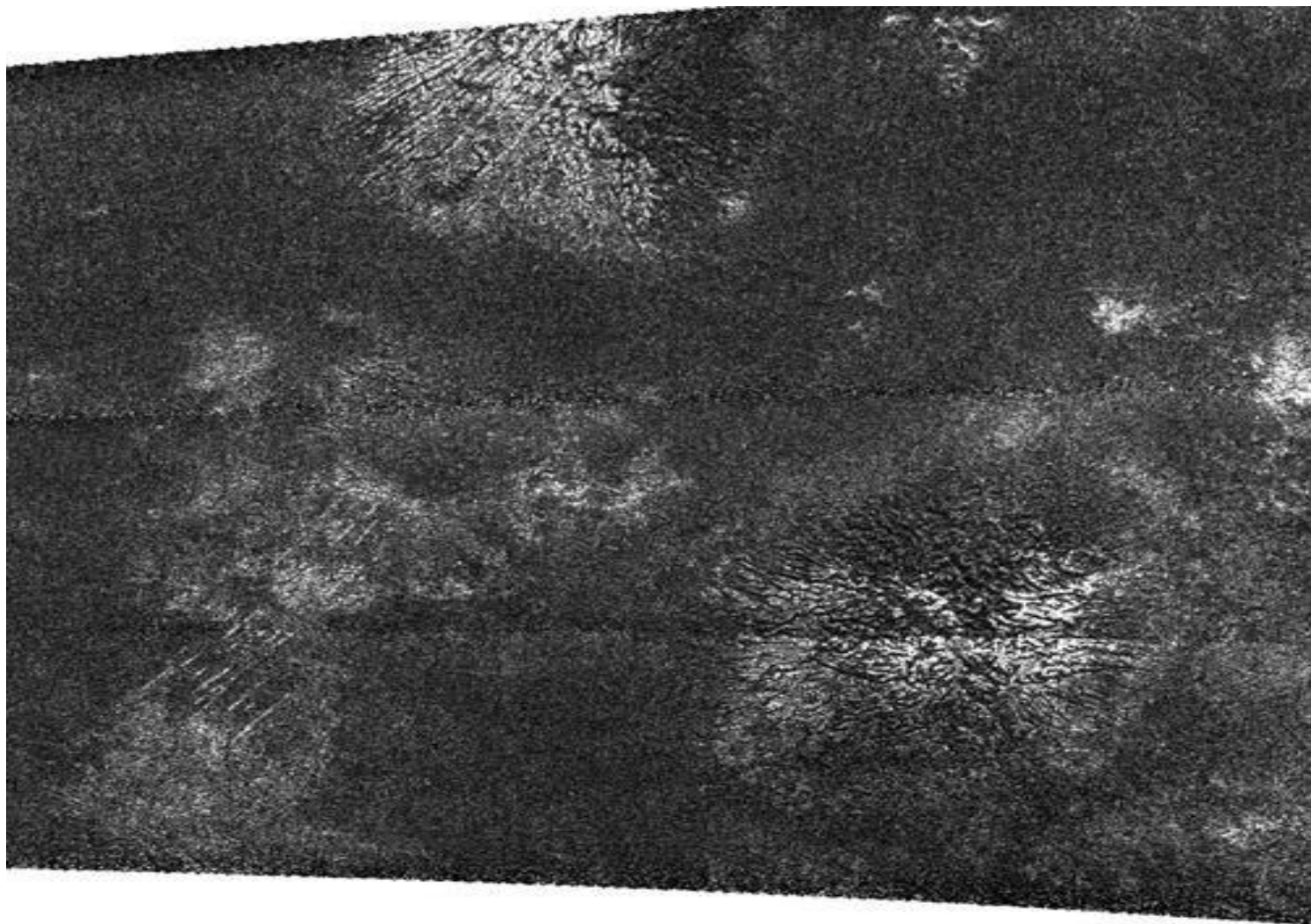


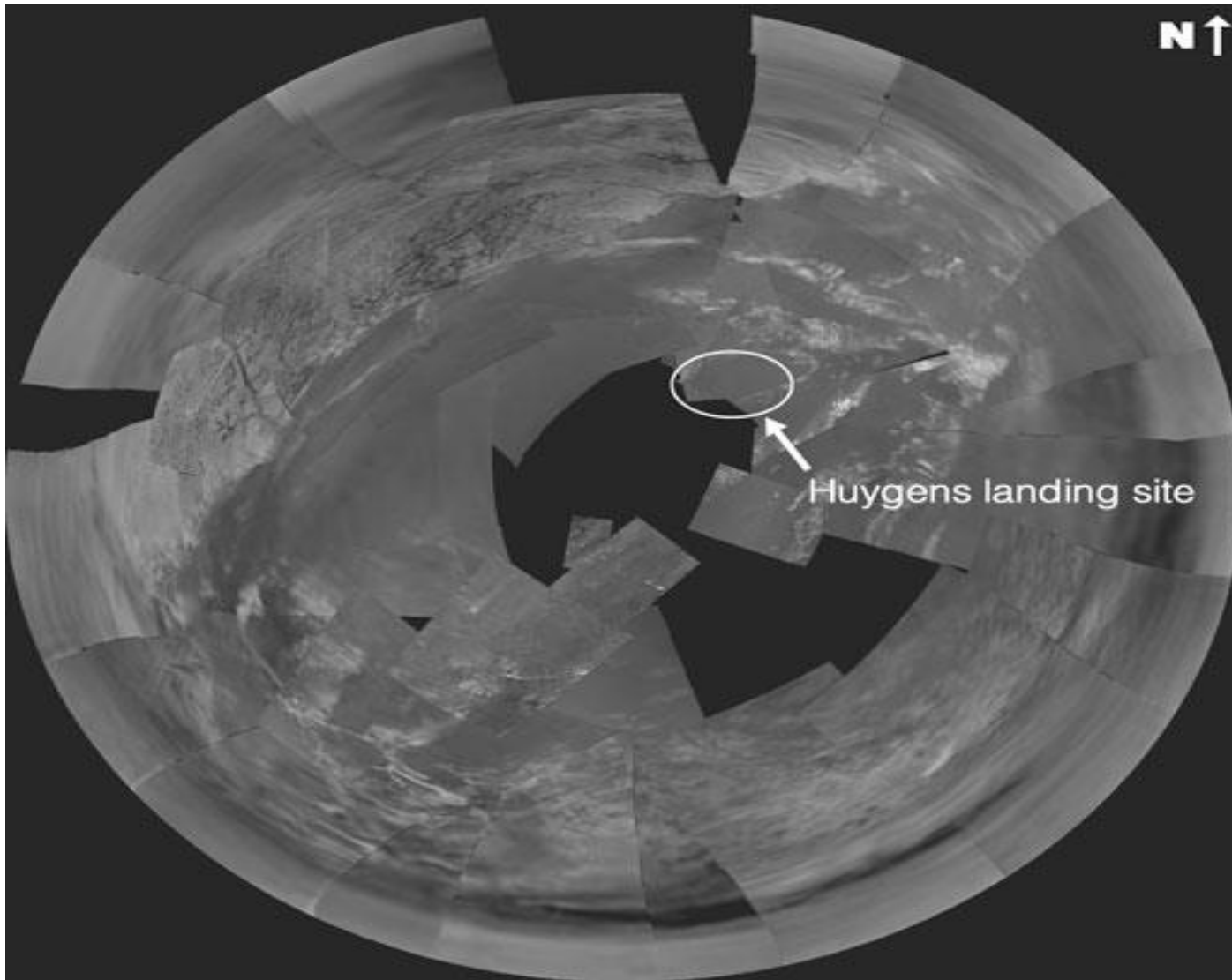


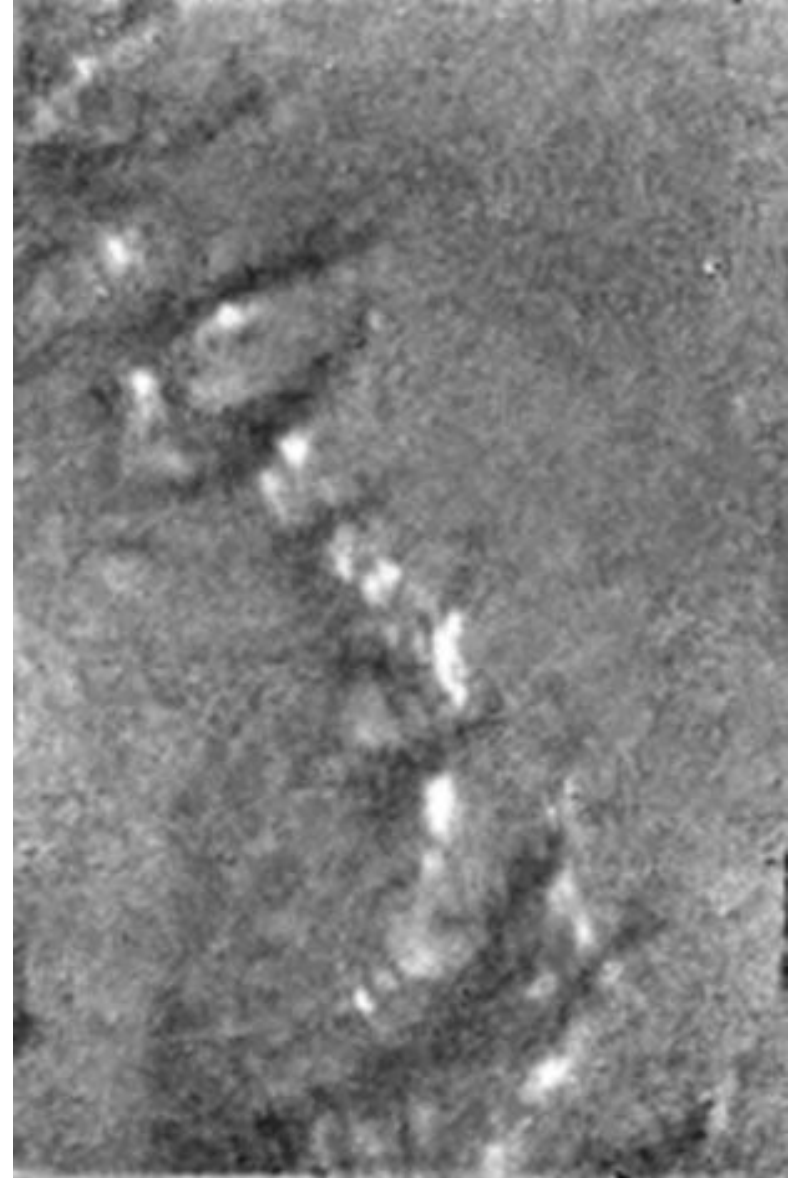


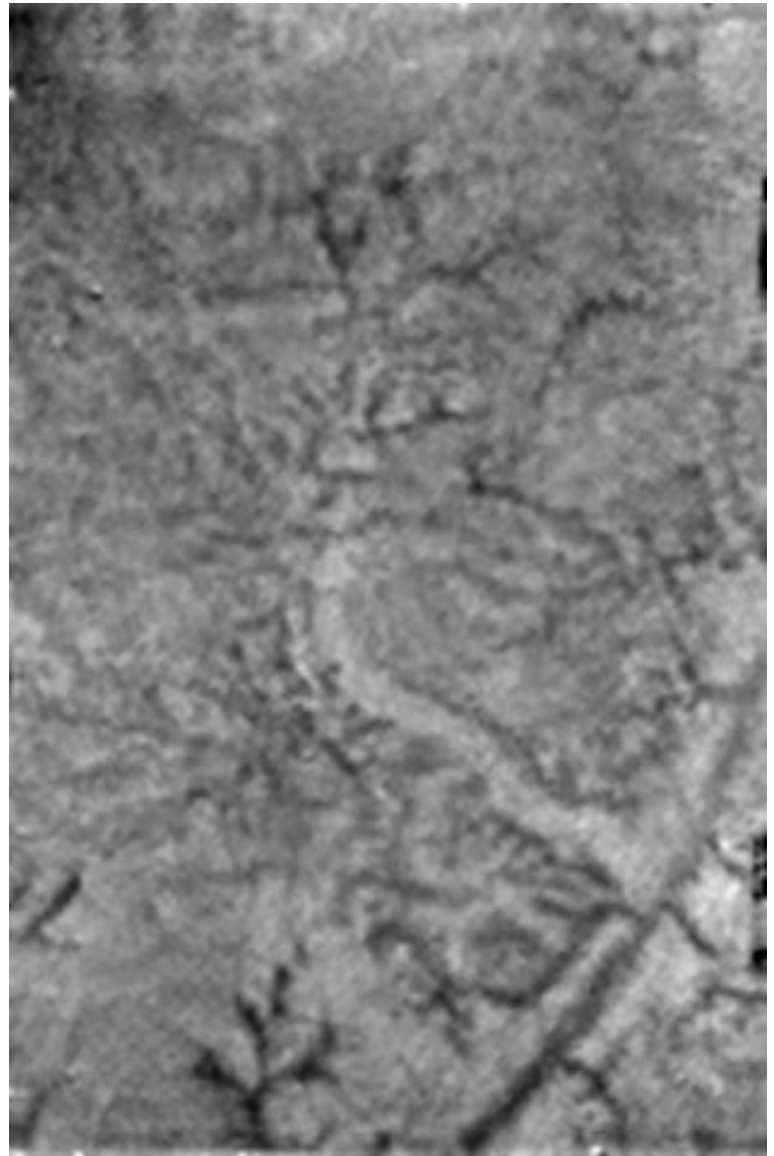
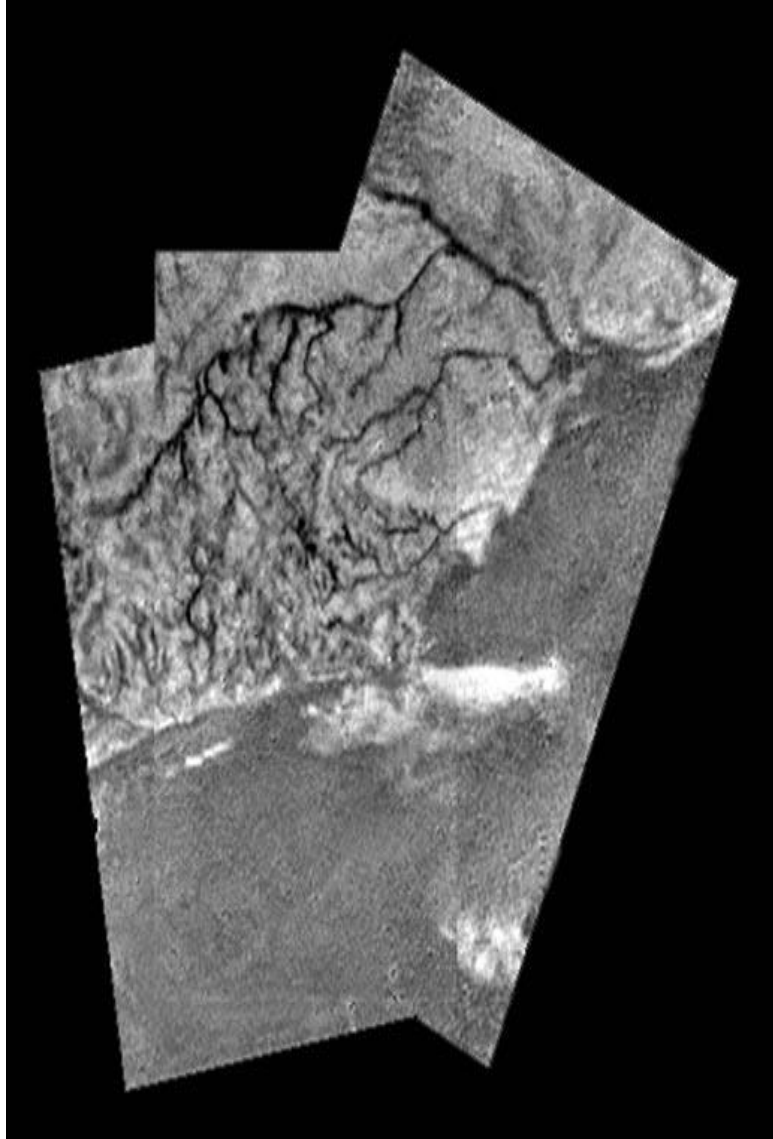








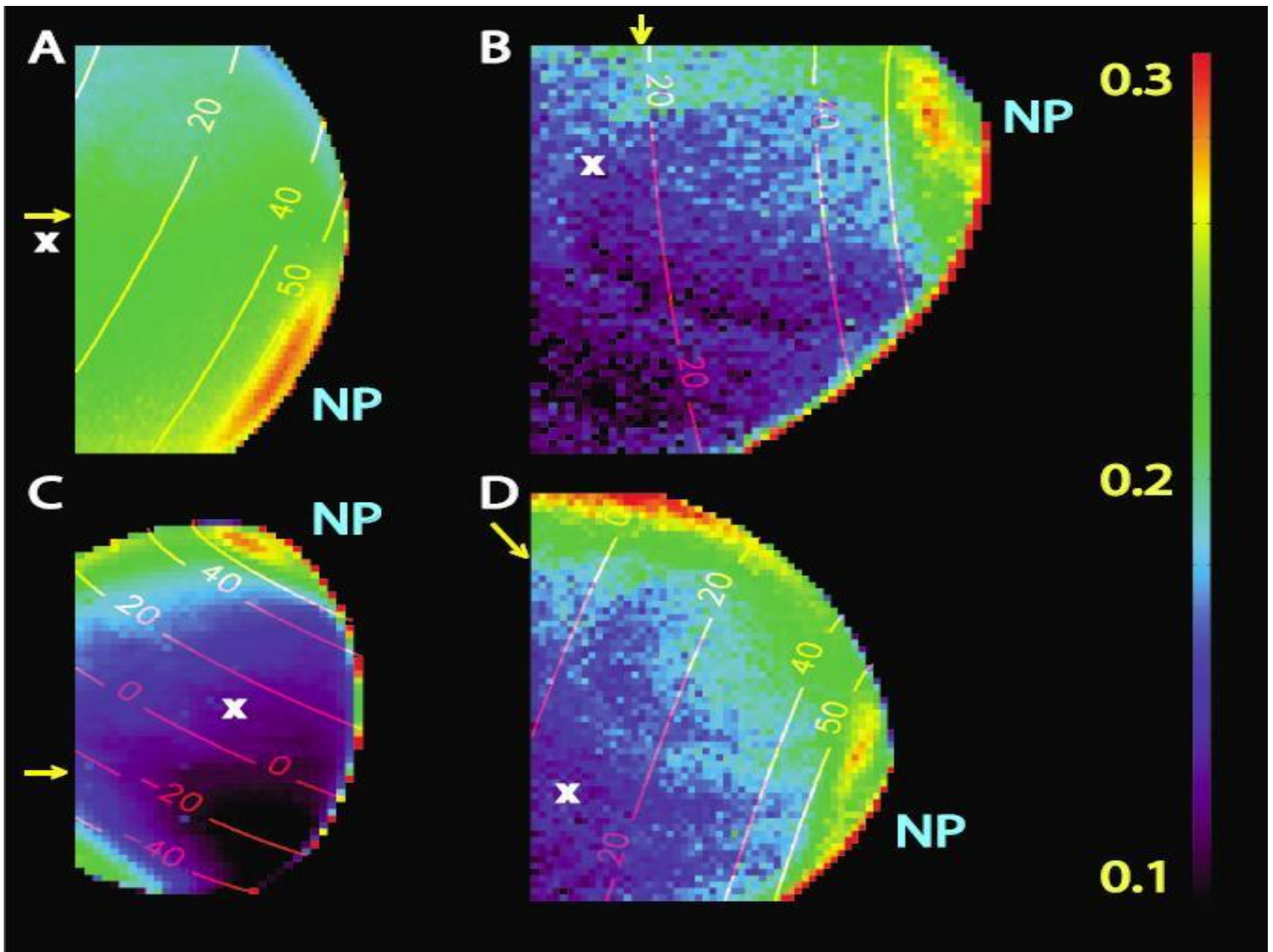






© Mark A. Garlick / markgarlick.com





Aerial Views of Titan around the Huygens Landing Site

Altitude

West

North

East

South

150
km

100
mi

30
km

20
mi

8
km

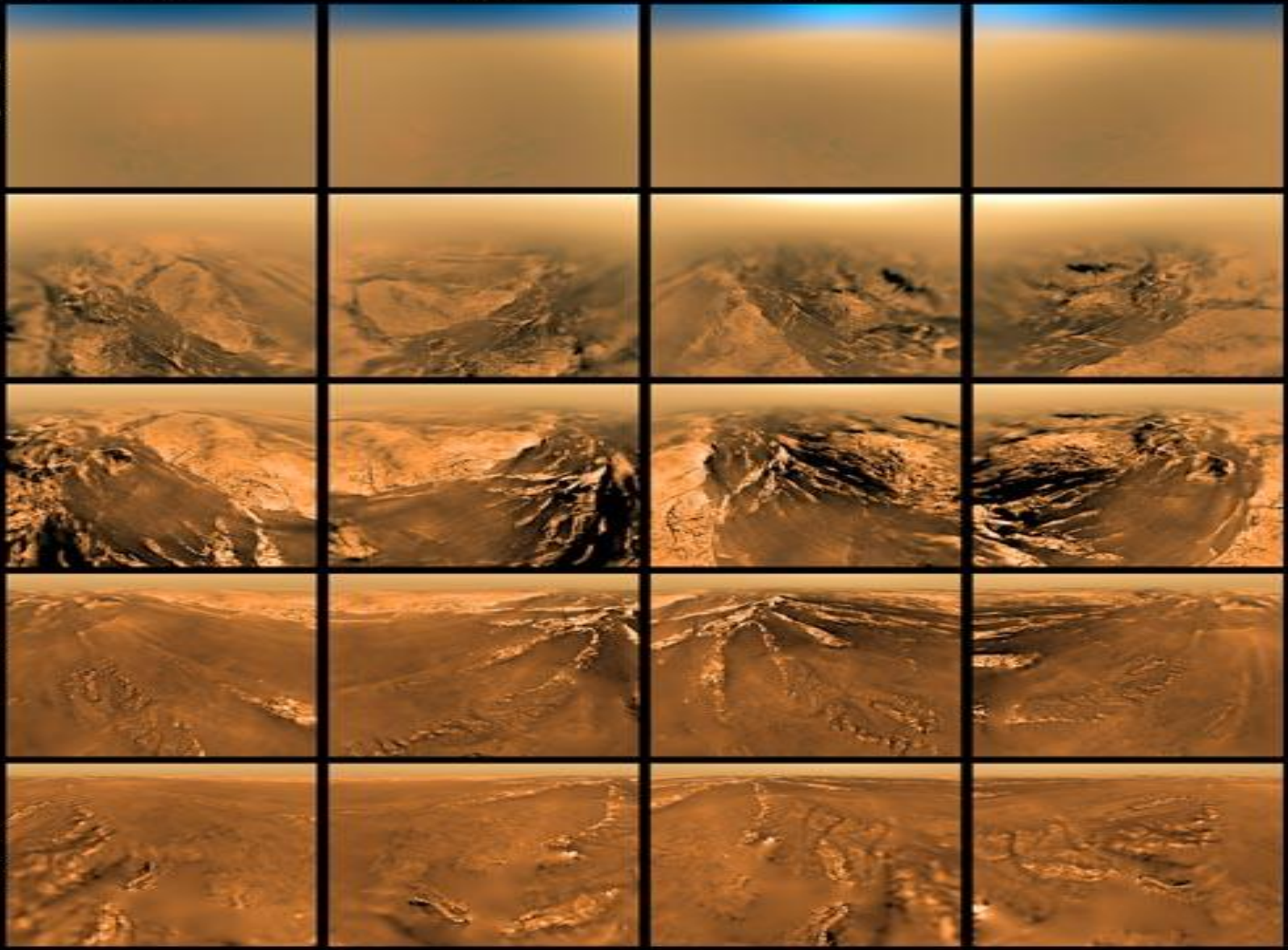
5
mi

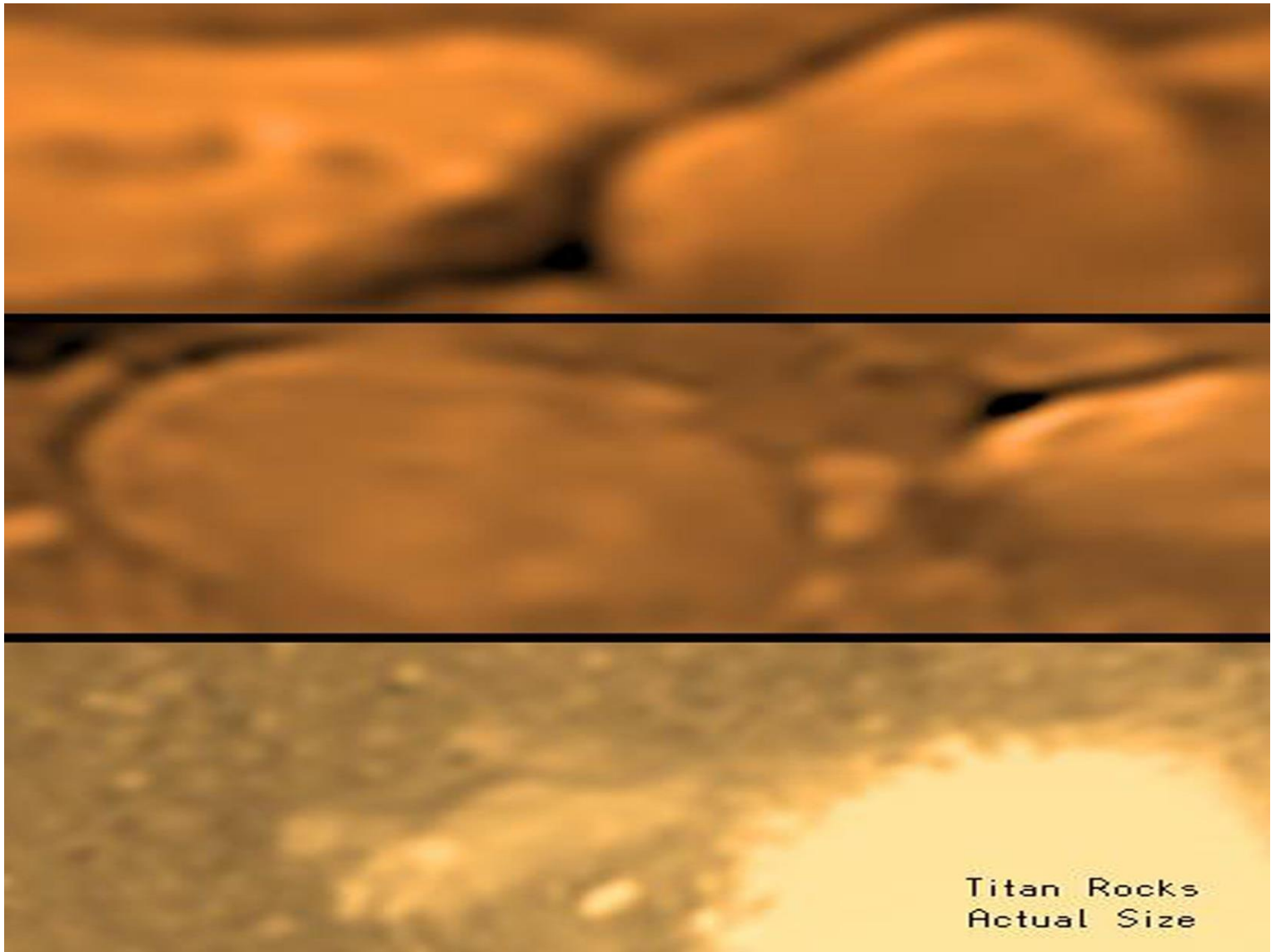
1.5
km

1
mi

0.3
km

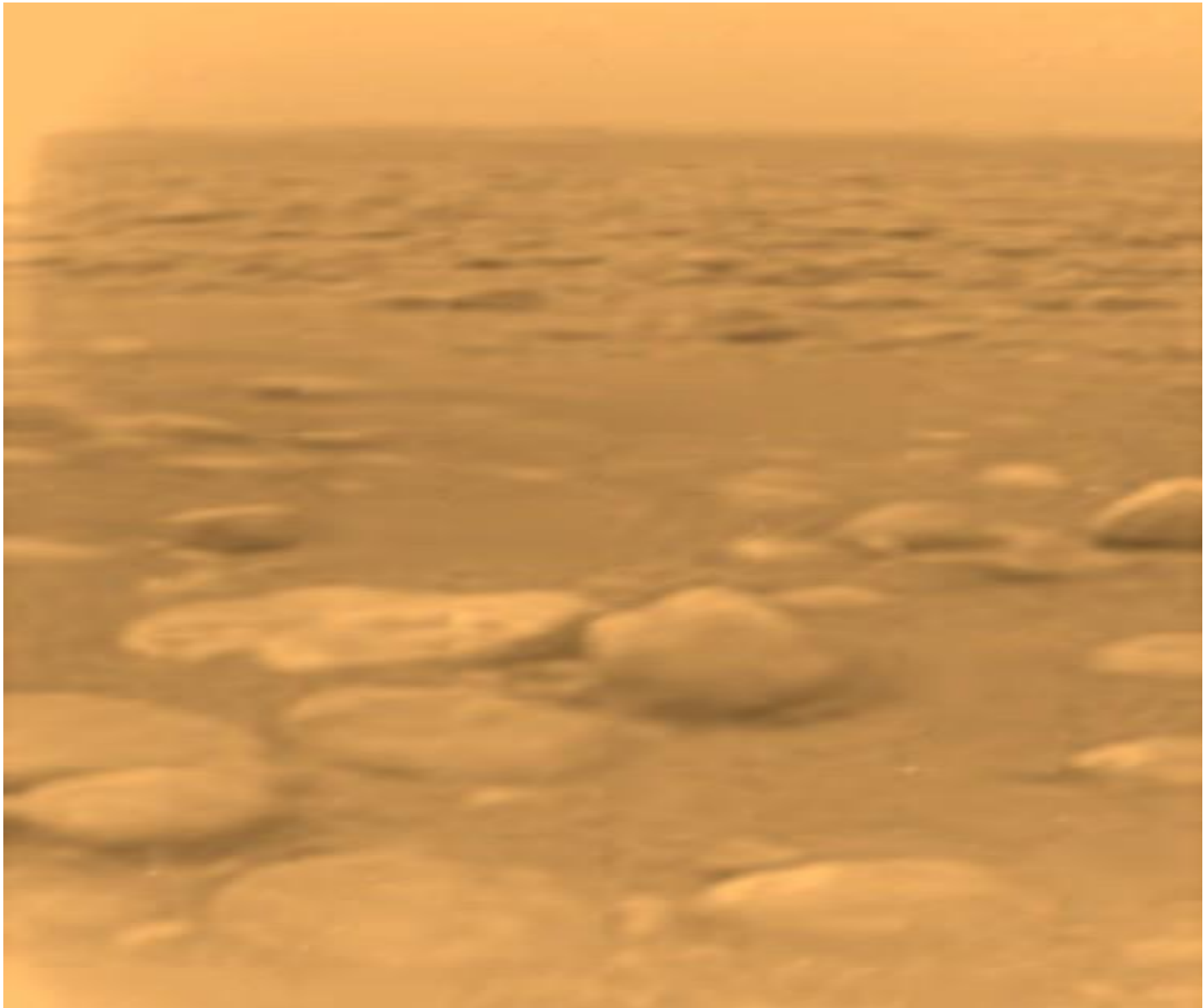
0.2
mi

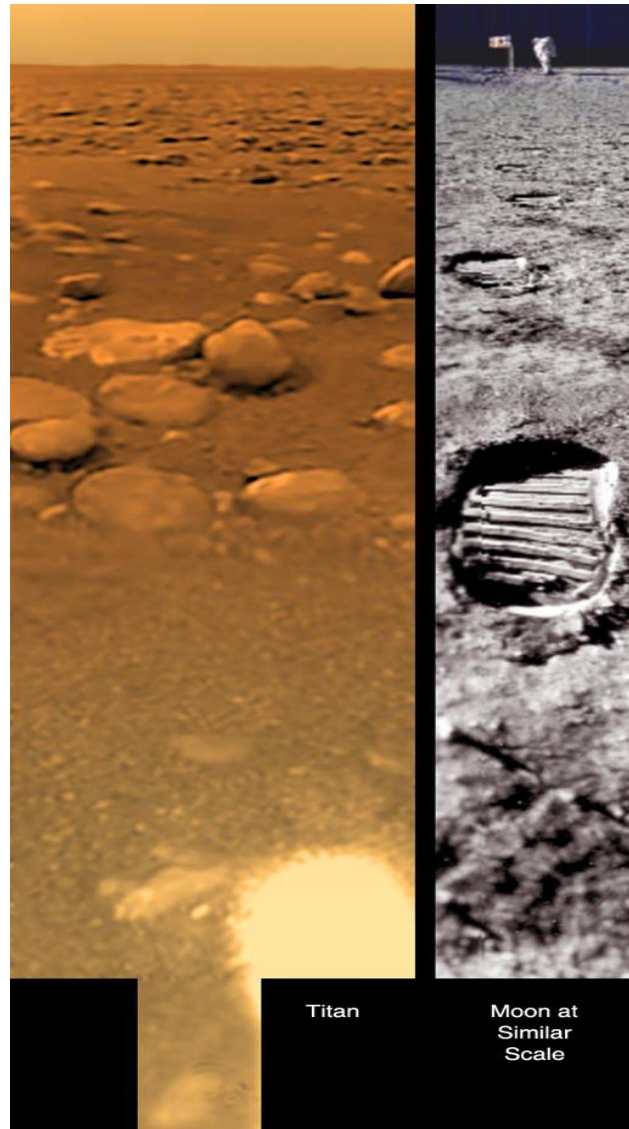




Titan Rocks
Actual Size



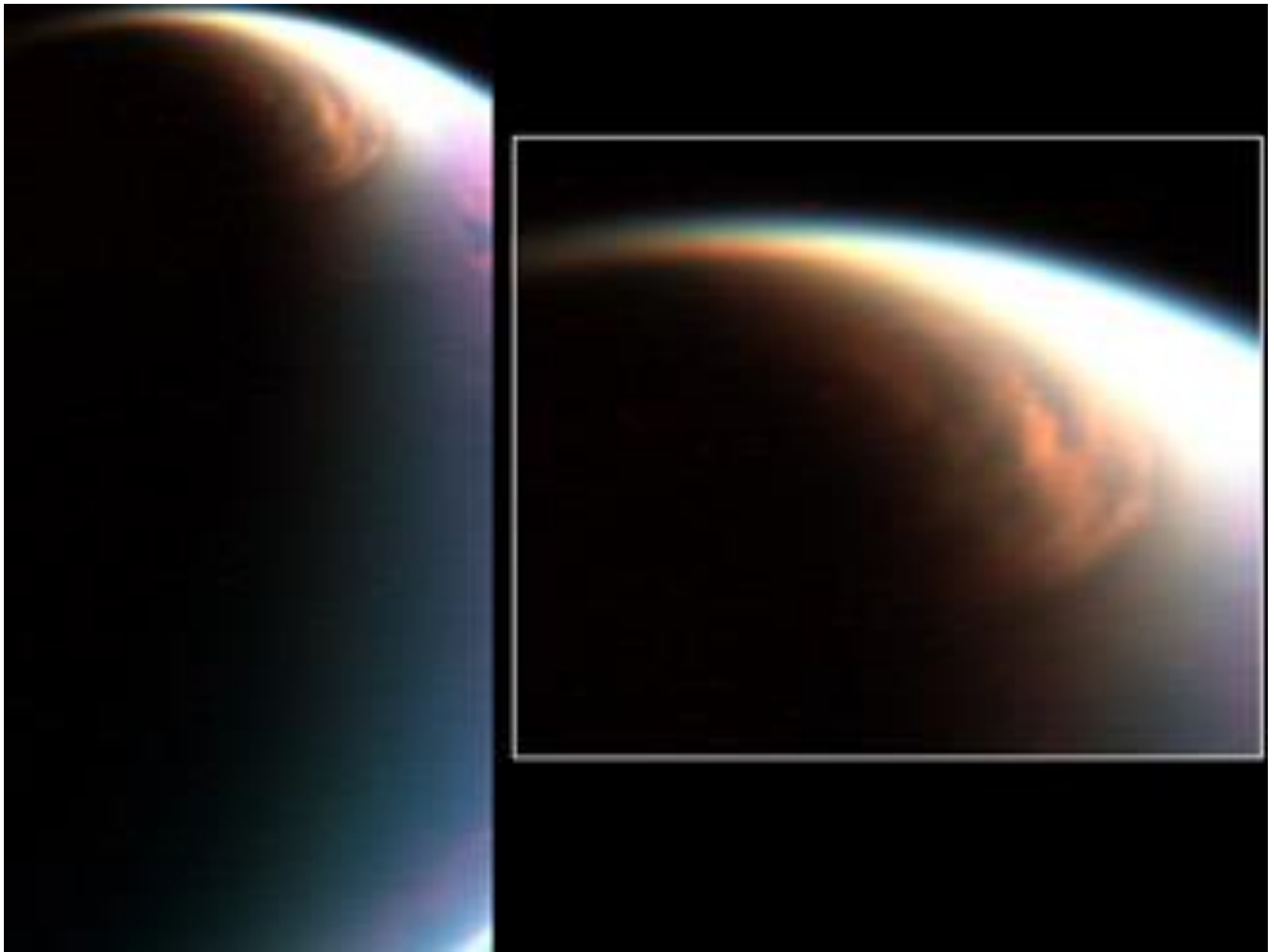


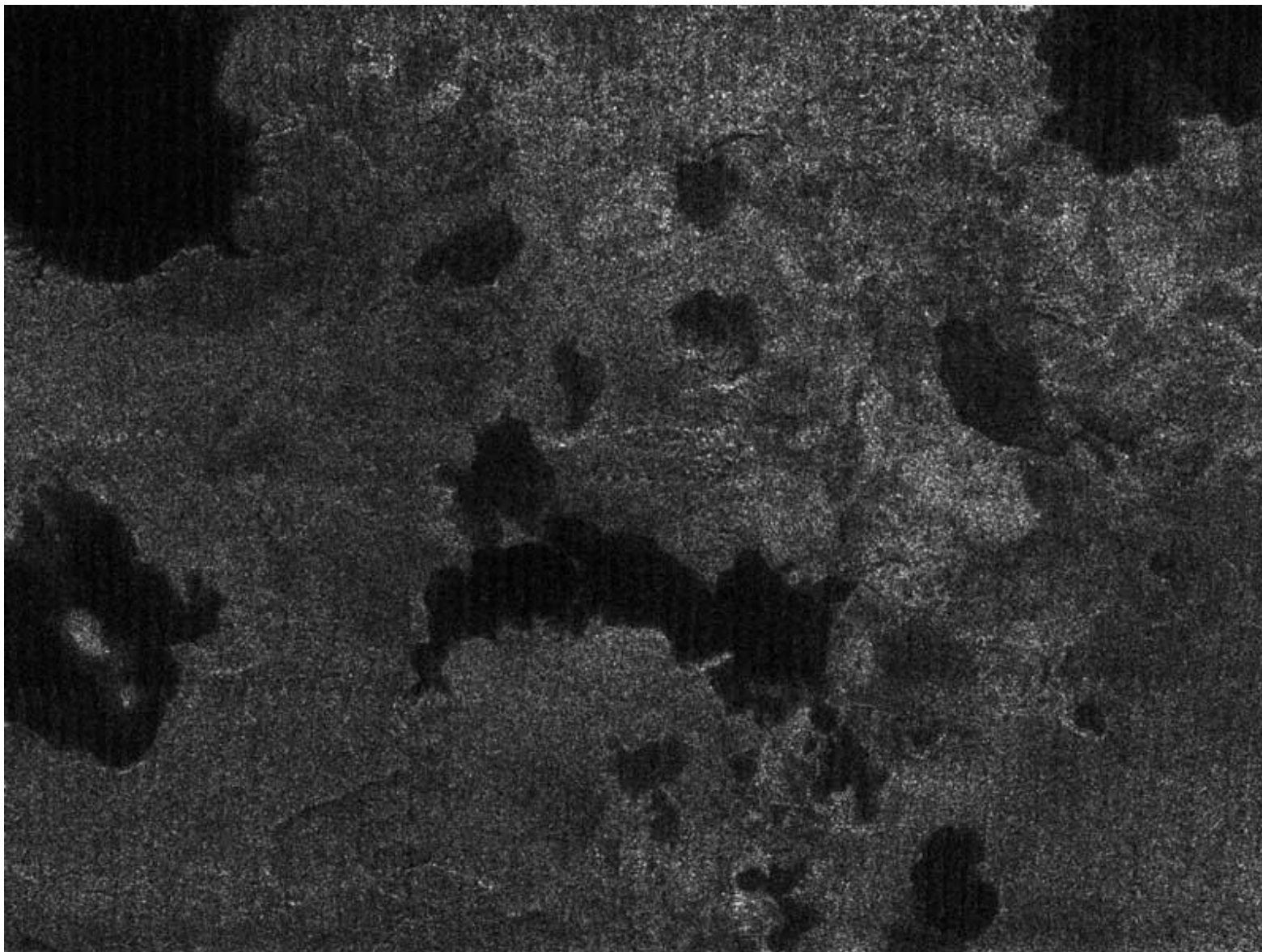


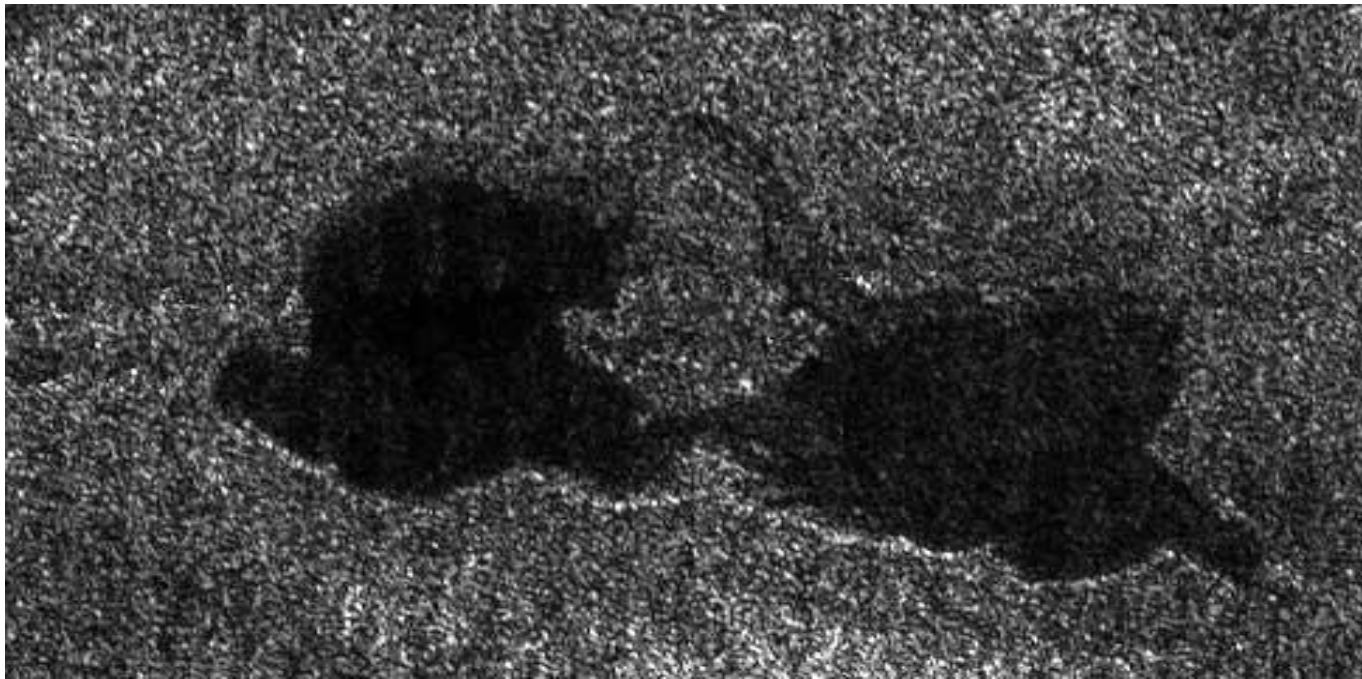
Titan

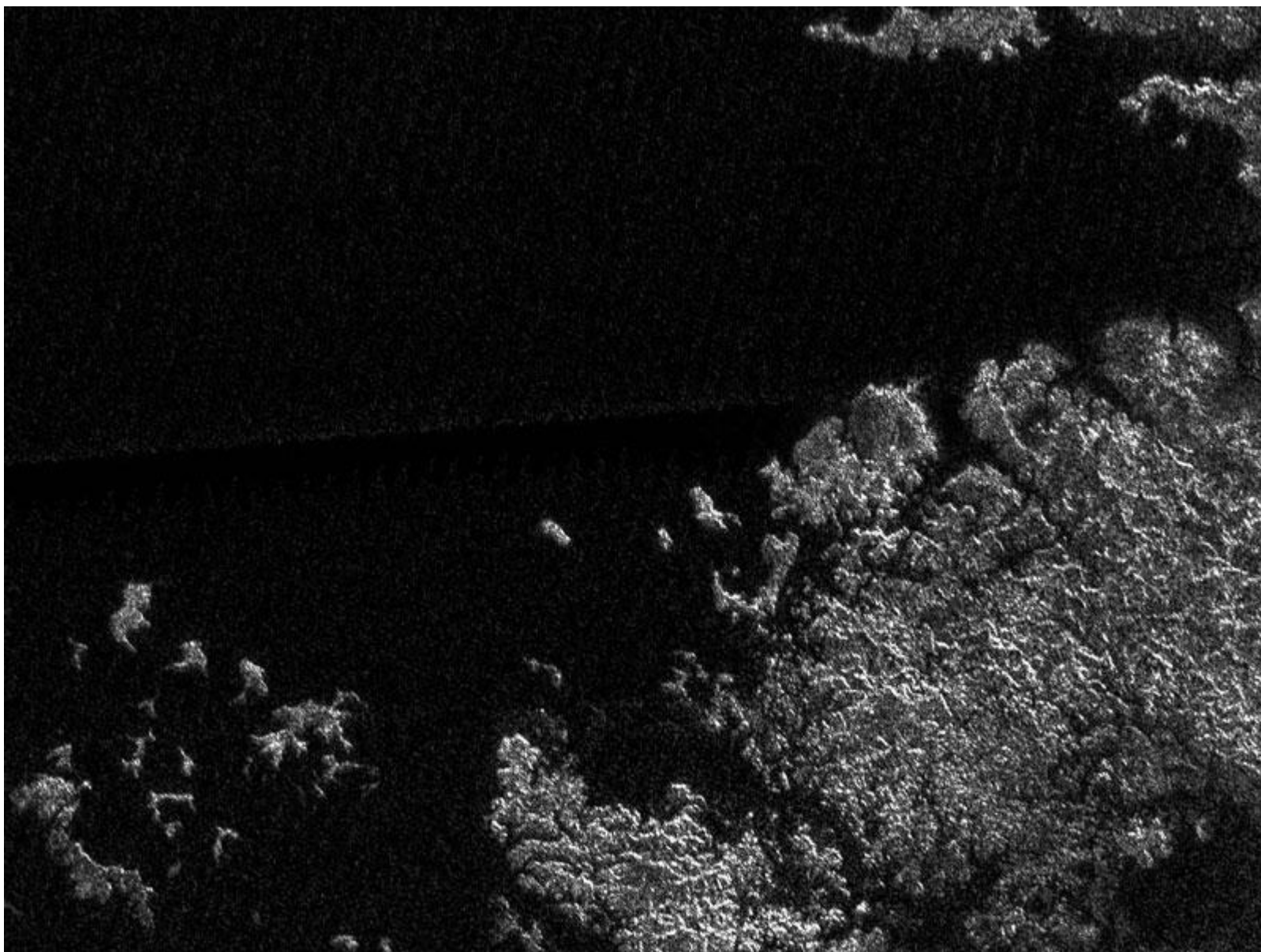
Moon at
Similar
Scale



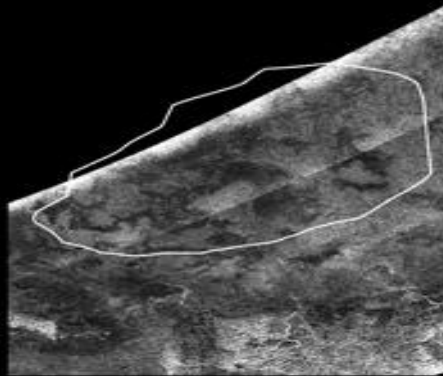
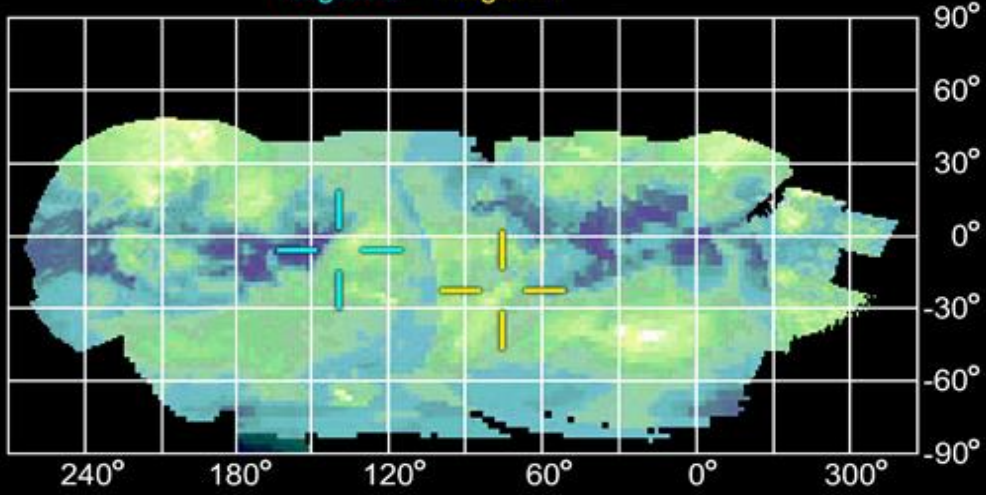




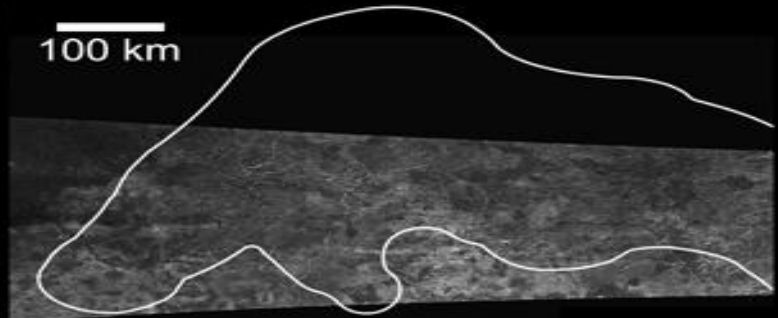




Region 2 Region 1

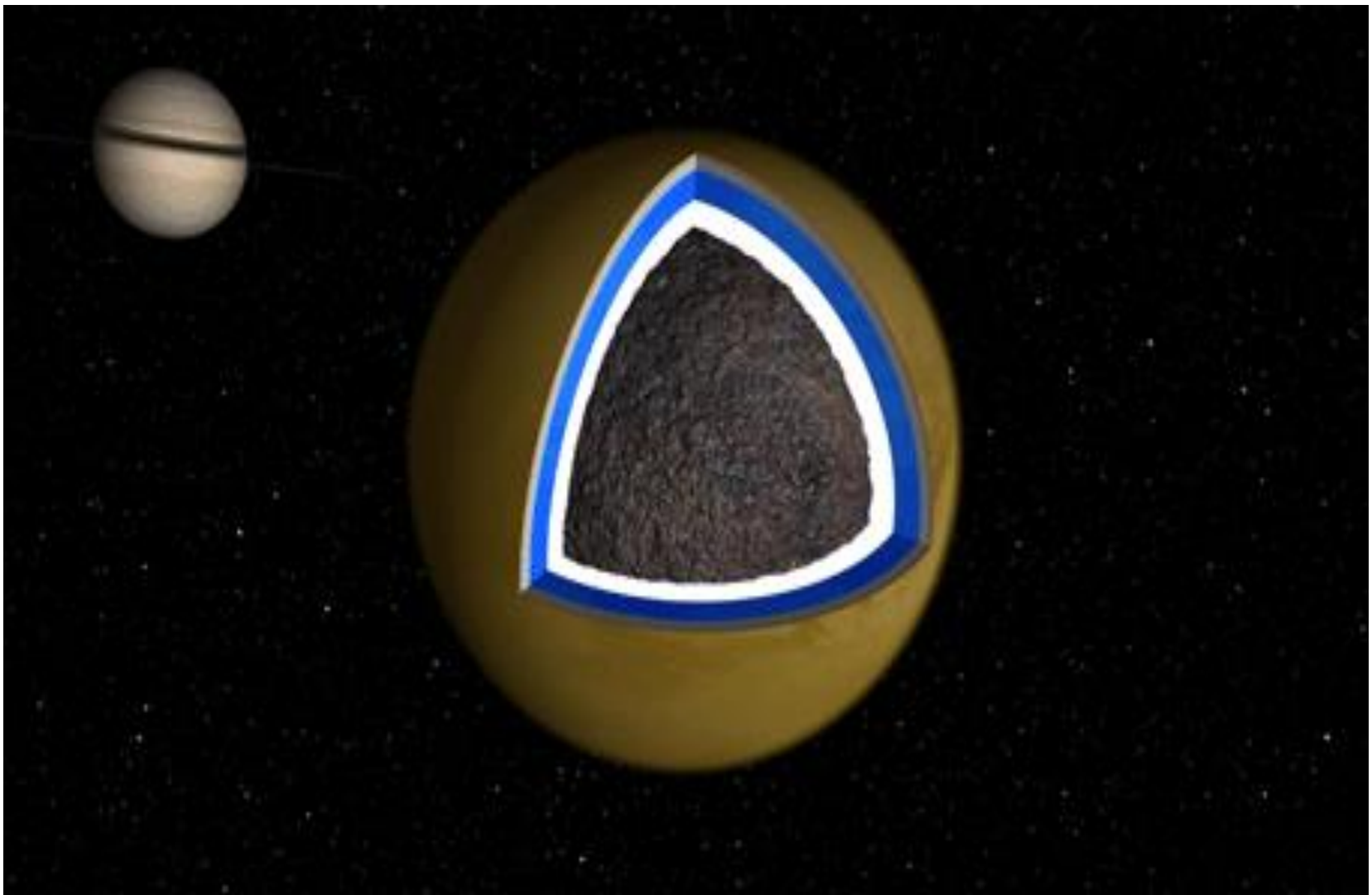


Region 1

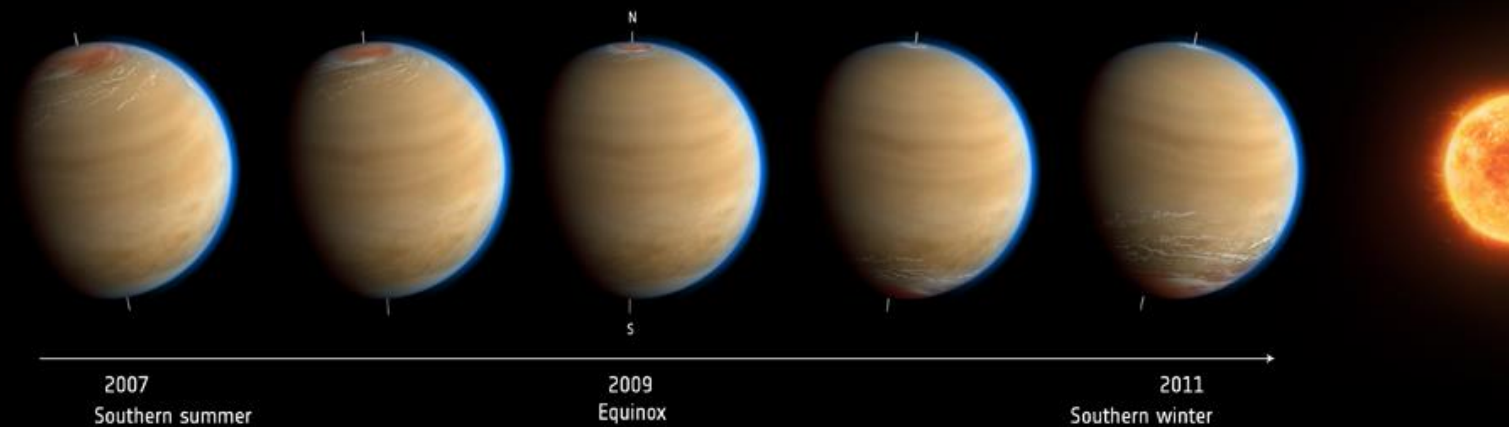


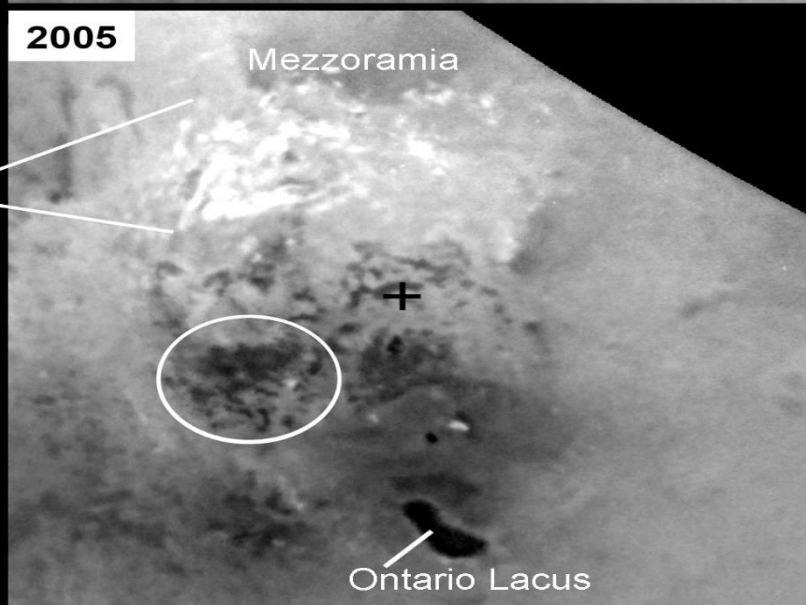
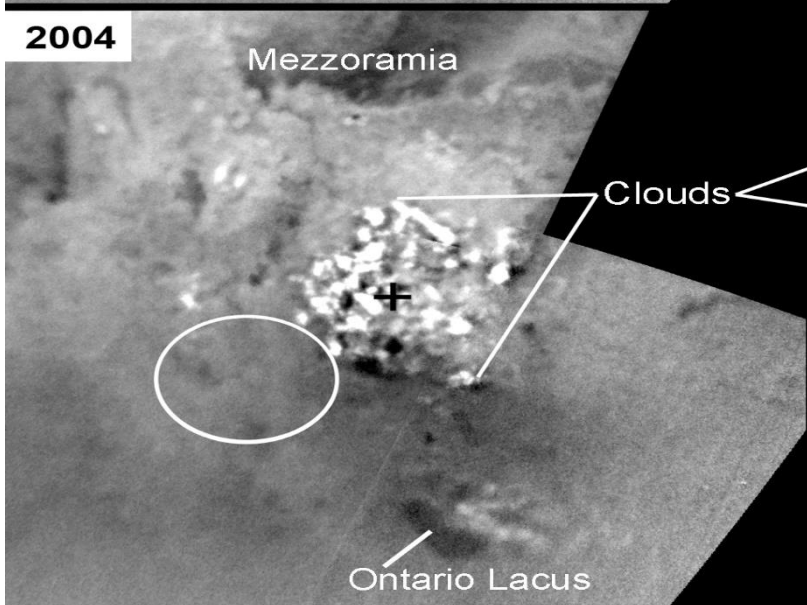
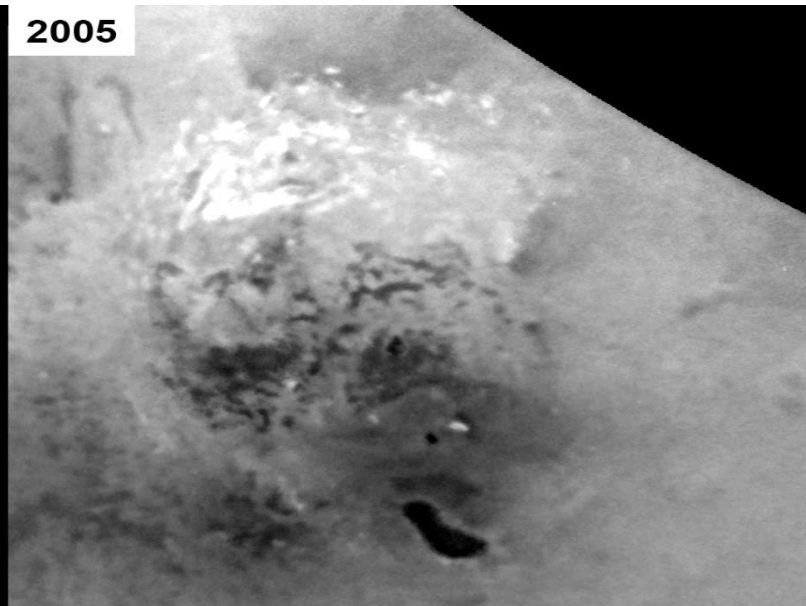
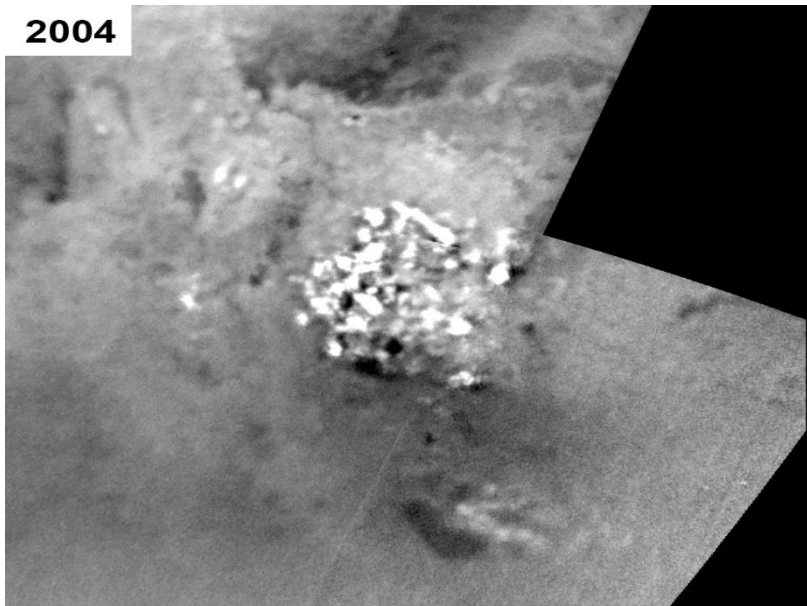
Region 2

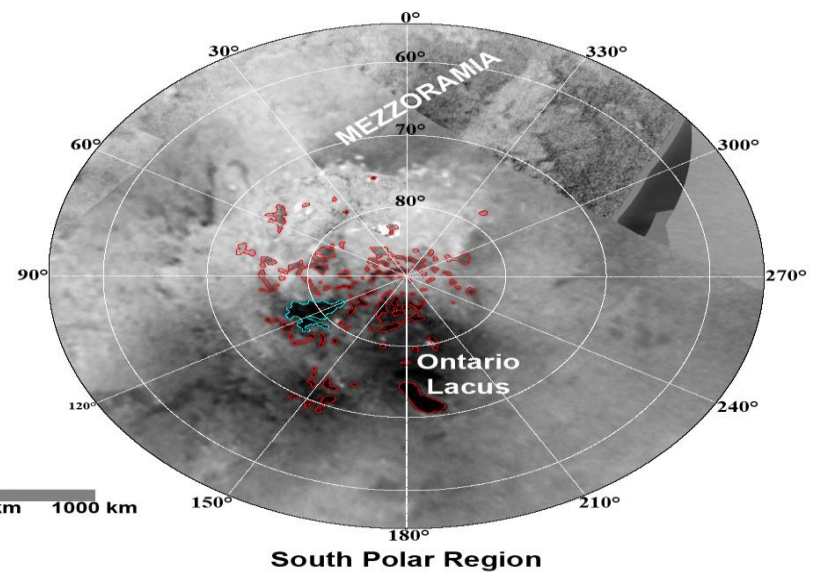
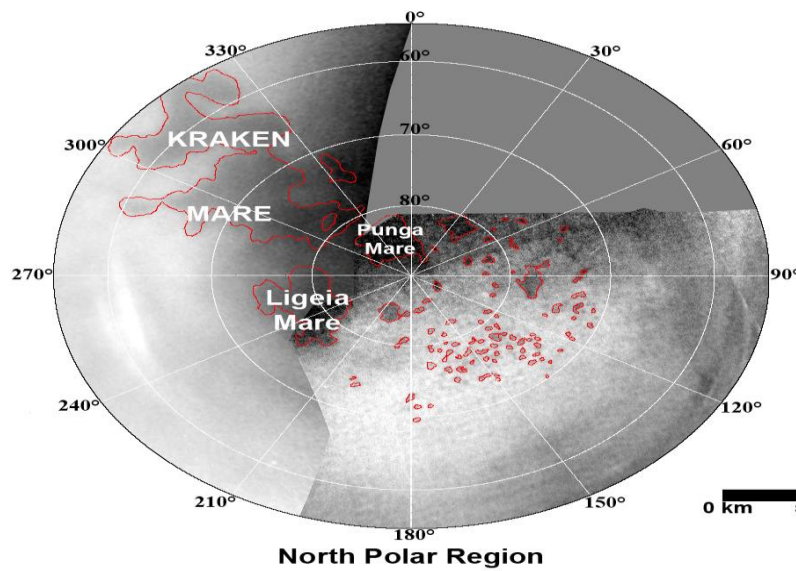
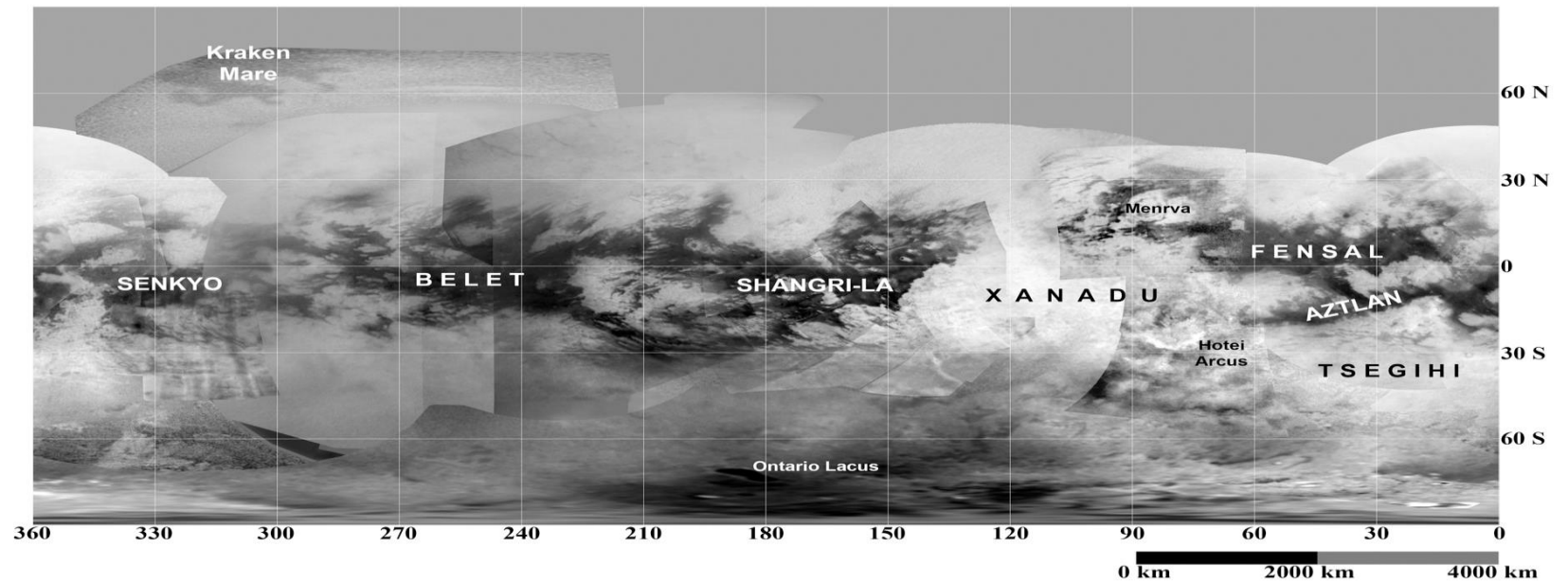


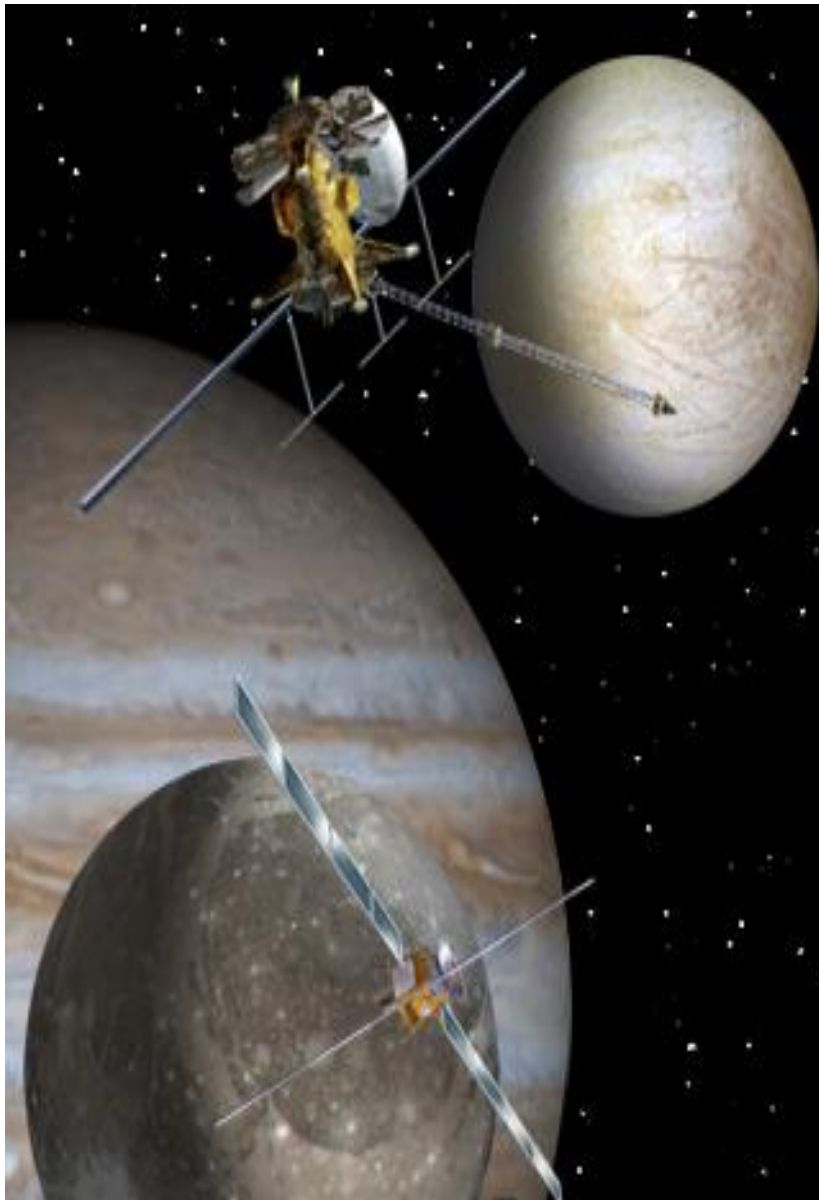


Titan's seasonal change

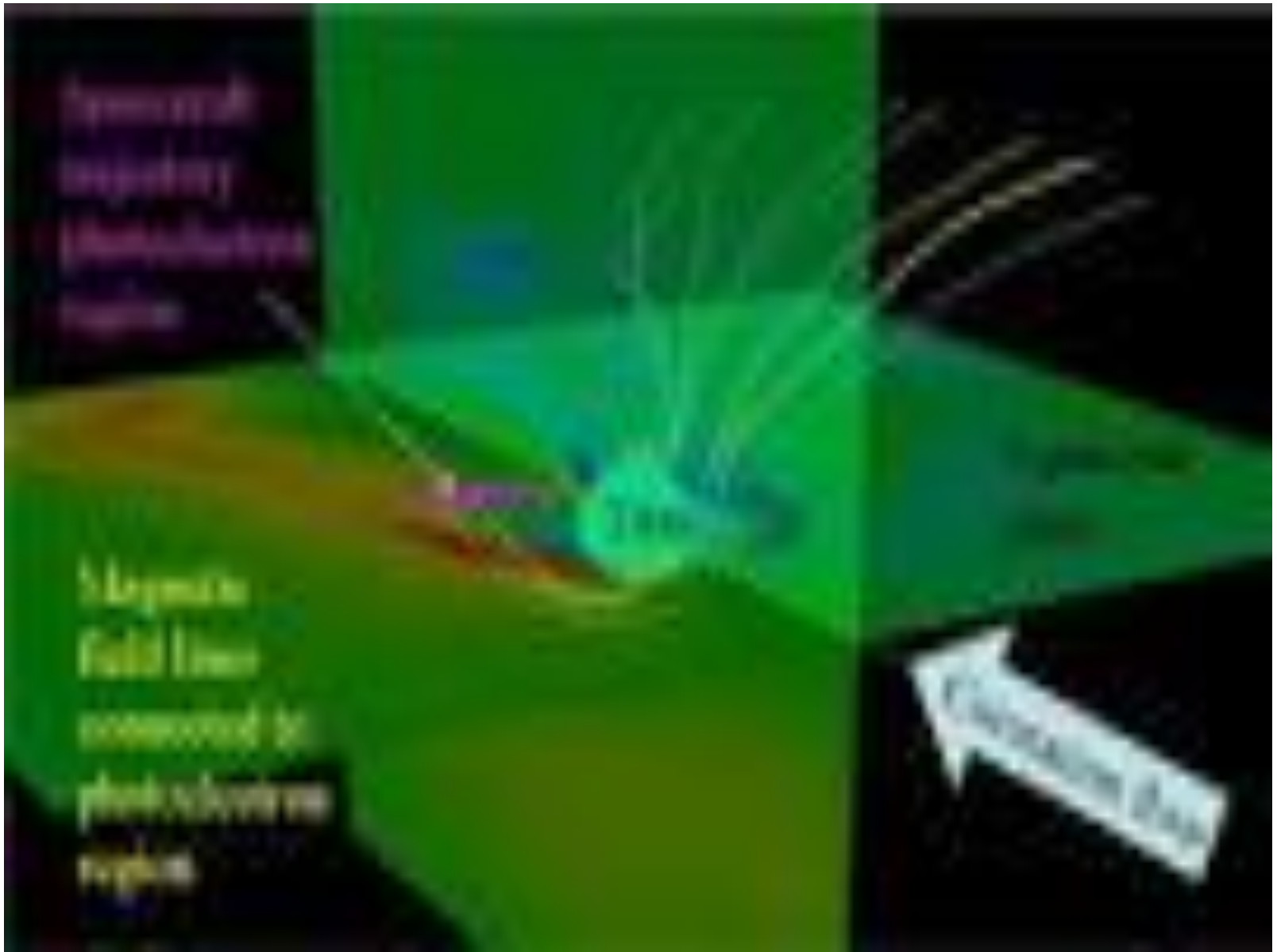


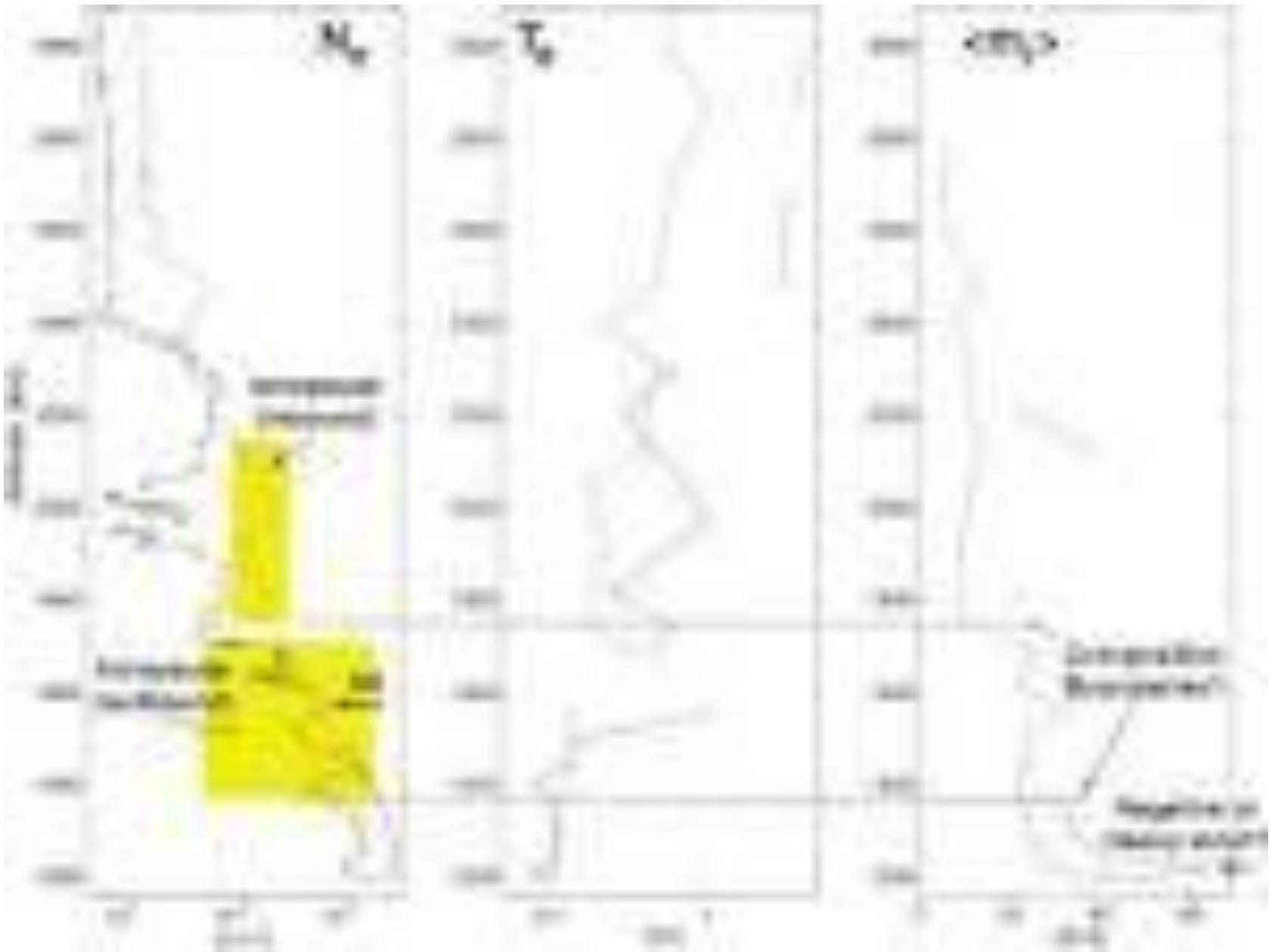


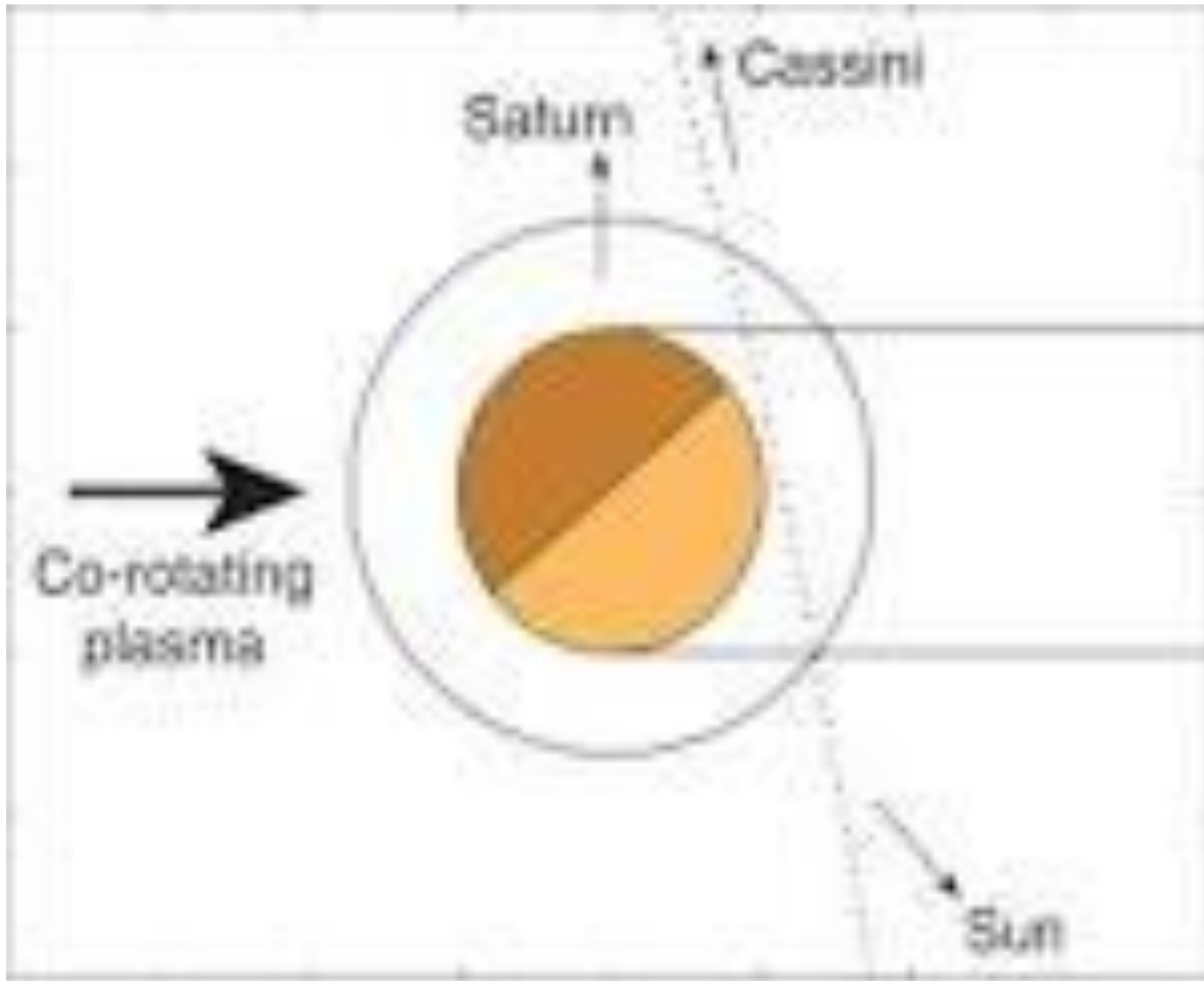


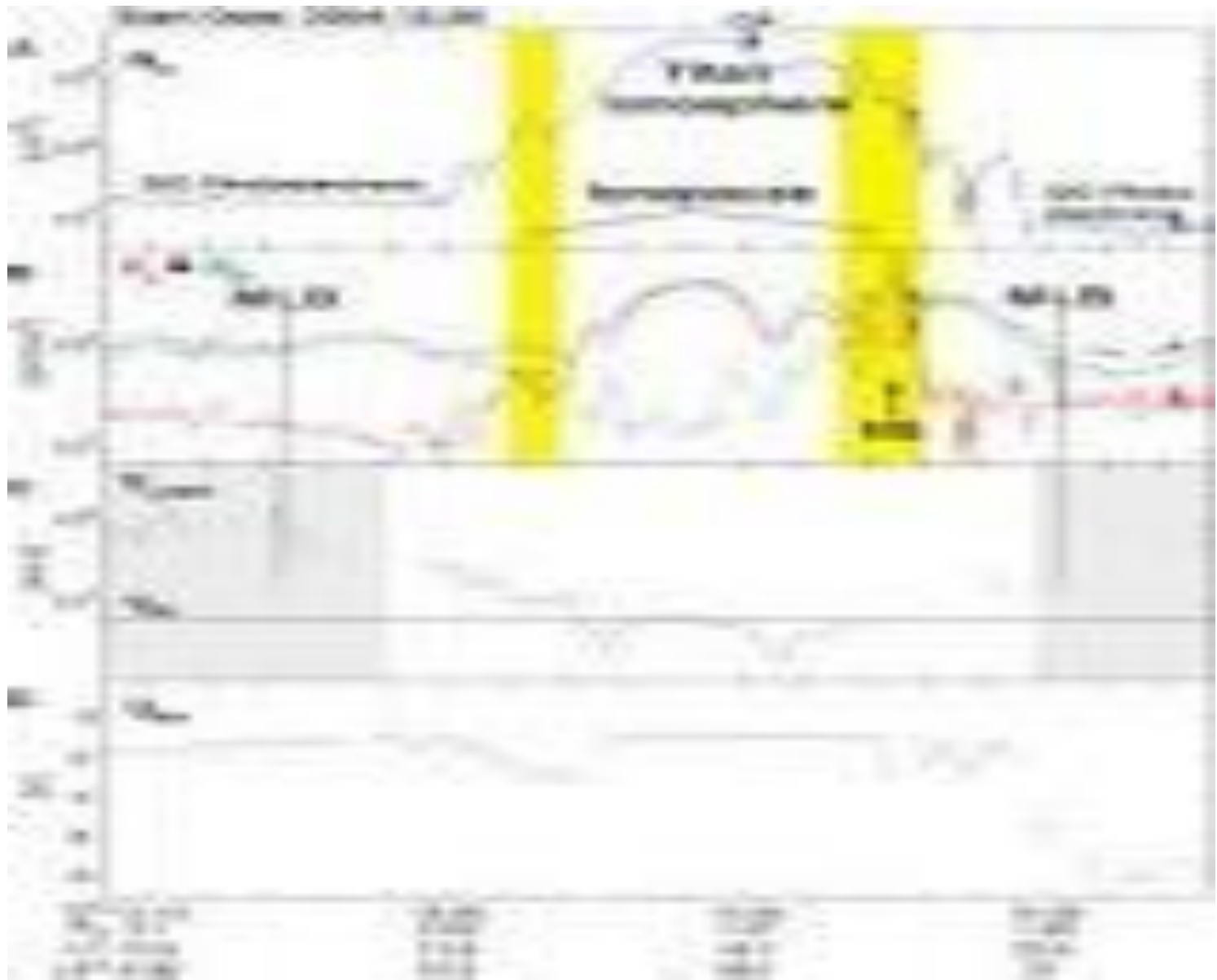




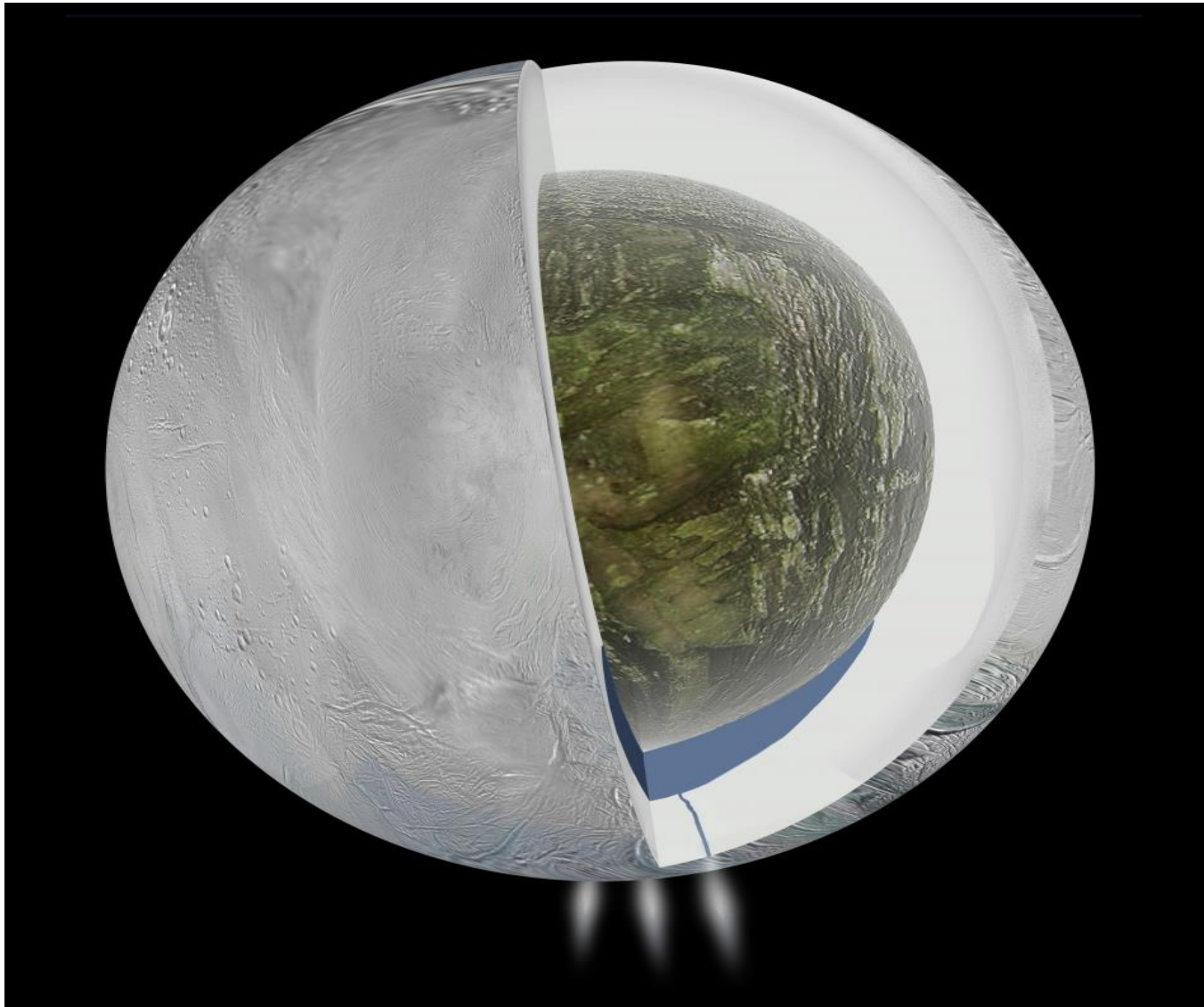




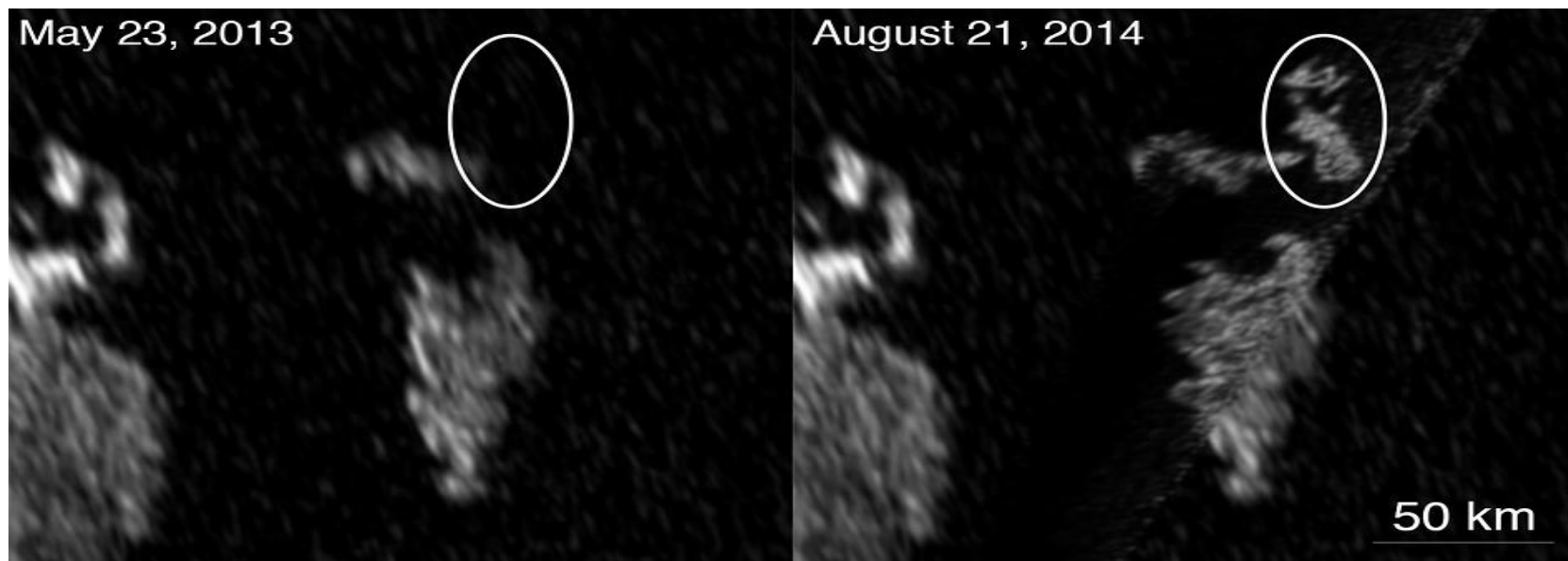
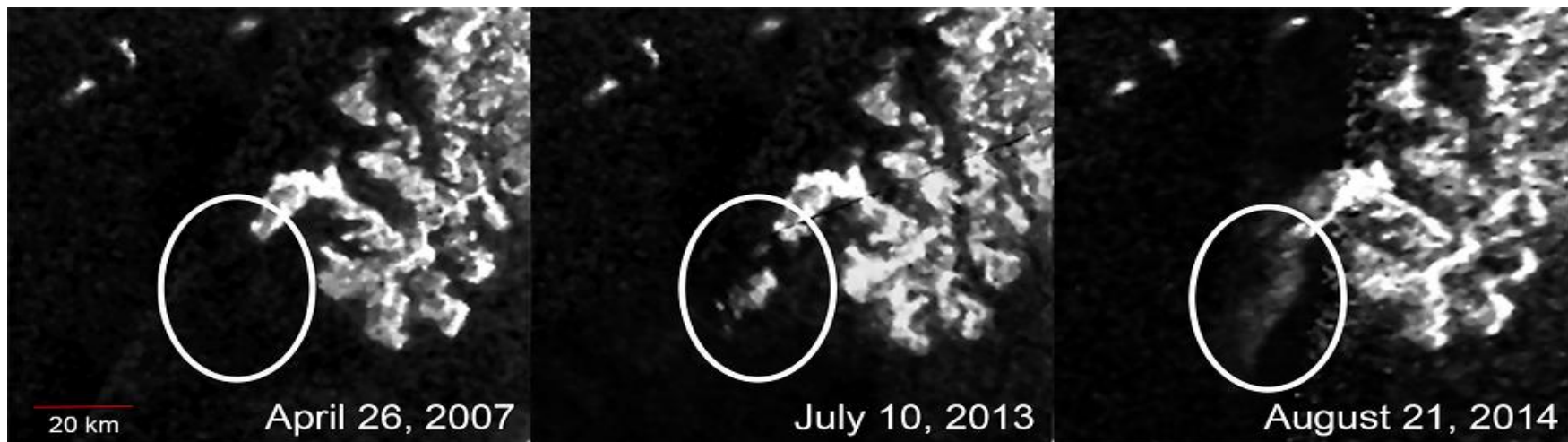


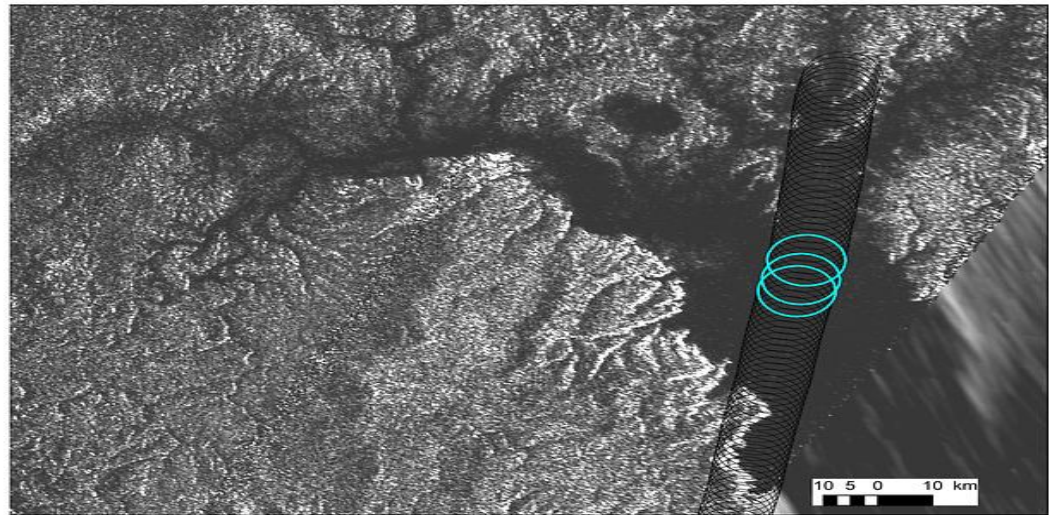
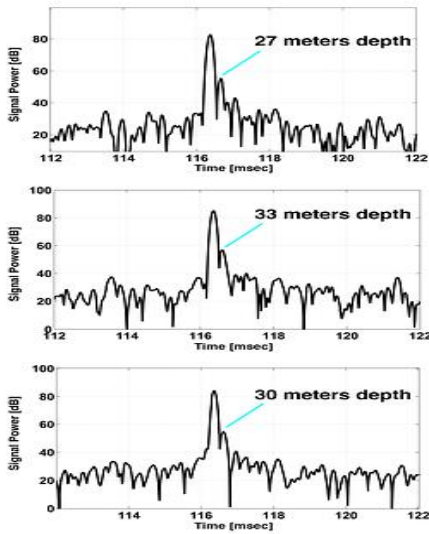
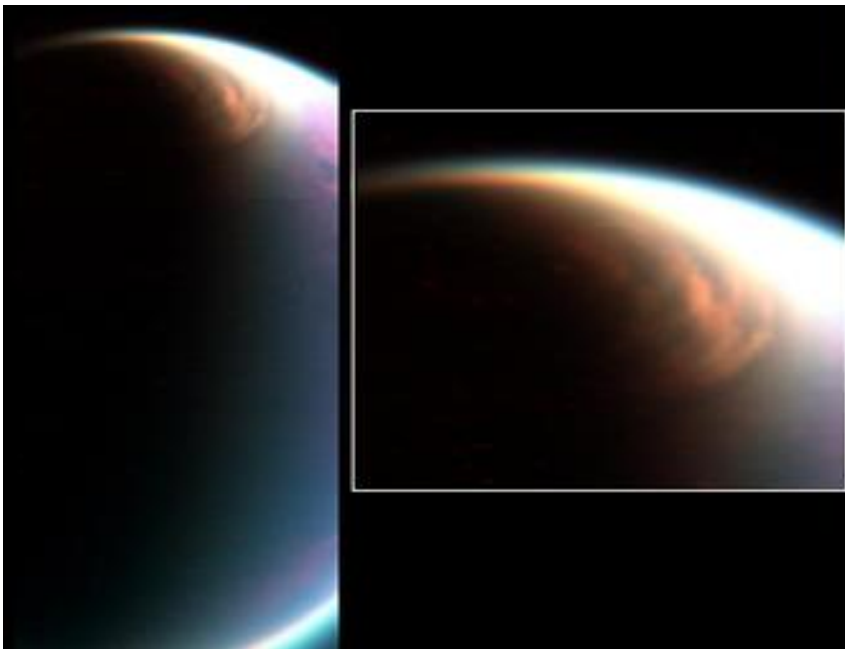


ΕΓΚΕΛΑΔΟΣ



LIGEIA and KRAKEN MARE





Τέλος Ενότητας

Χρηματοδότηση

- Το παρόν εκπαιδευτικό υλικό έχει αναπτυχθεί στο πλαίσιο του εκπαιδευτικού έργου του διδάσκοντα.
- Το έργο «**Ανοικτά Ακαδημαϊκά Μαθήματα στο Πανεπιστήμιο Αθηνών**» έχει χρηματοδοτήσει μόνο την αναδιαμόρφωση του εκπαιδευτικού υλικού.
- Το έργο υλοποιείται στο πλαίσιο του Επιχειρησιακού Προγράμματος «Εκπαίδευση και Δια Βίου Μάθηση» και συγχρηματοδοτείται από την Ευρωπαϊκή Ένωση (Ευρωπαϊκό Κοινωνικό Ταμείο) και από εθνικούς πόρους.



Σημειώματα

Σημείωμα Ιστορικού Εκδόσεων Έργου

Το παρόν έργο αποτελεί την έκδοση 1.0.0.



Σημείωμα Αναφοράς

Copyright Εθνικών και Καποδιστριακών Πανεπιστημίων Αθηνών, Παναγιώτα Πρέκα 2015. «Εισαγωγή στην Αστροφυσική. Πλανητικό σύστημα». Έκδοση: 1.0. Αθήνα 2015. Διαθέσιμο από τη δικτυακή διεύθυνση:

<http://opencourses.uoa.gr/courses/PHYS1/>



Σημείωμα Αδειοδότησης

Το παρόν υλικό διατίθεται με τους όρους της άδειας χρήσης Creative Commons Αναφορά, Μη Εμπορική Χρήση Παρόμοια Διανομή 4.0 [1] ή μεταγενέστερη, Διεθνής Έκδοση. Εξαιρούνται τα αυτοτελή έργα τρίτων π.χ. φωτογραφίες, διαγράμματα κ.λ.π., τα οποία εμπεριέχονται σε αυτό και τα οποία αναφέρονται μαζί με τους όρους χρήσης τους στο «Σημείωμα Χρήσης Έργων Τρίτων».



[1] <http://creativecommons.org/licenses/by-nc-nd/4.0/>

Ως **Μη Εμπορική** ορίζεται η χρήση:

- που δεν περιλαμβάνει άμεσο ή έμμεσο οικονομικό όφελος από την χρήση του έργου, για το διανομέα του έργου και αδειοδόχο
- που δεν περιλαμβάνει οικονομική συναλλαγή ως προϋπόθεση για τη χρήση ή πρόσβαση στο έργο
- που δεν προσπορίζει στο διανομέα του έργου και αδειοδόχο έμμεσο οικονομικό όφελος (π.χ. διαφημίσεις) από την προβολή του έργου σε διαδικτυακό τόπο

Ο δικαιούχος μπορεί να παρέχει στον αδειοδόχο ξεχωριστή άδεια να χρησιμοποιεί το έργο για εμπορική χρήση, εφόσον αυτό του ζητηθεί.



Διατήρηση Σημειωμάτων

Οποιαδήποτε αναπαραγωγή ή διασκευή του υλικού θα πρέπει να συμπεριλαμβάνει:

- το Σημείωμα Αναφοράς
- το Σημείωμα Αδειοδότησης
- τη δήλωση Διατήρησης Σημειωμάτων
- το Σημείωμα Χρήσης Έργων Τρίτων (εφόσον υπάρχει)

μαζί με τους συνοδευόμενους υπερσυνδέσμους.

