

Impact-Induced Demagnetization in Martian Crust with High-Resolution MAVEN Data

Zain Eris Kamal

Advised by Prof. Lujendra Ojha; Rutgers University



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New Jersey Space
Grant Consortium



Outline

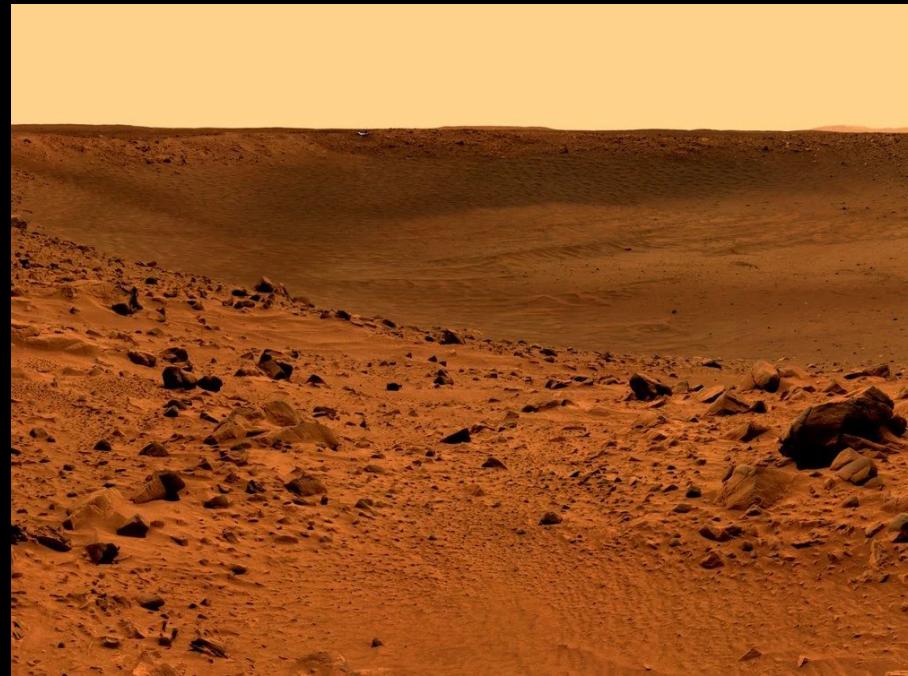
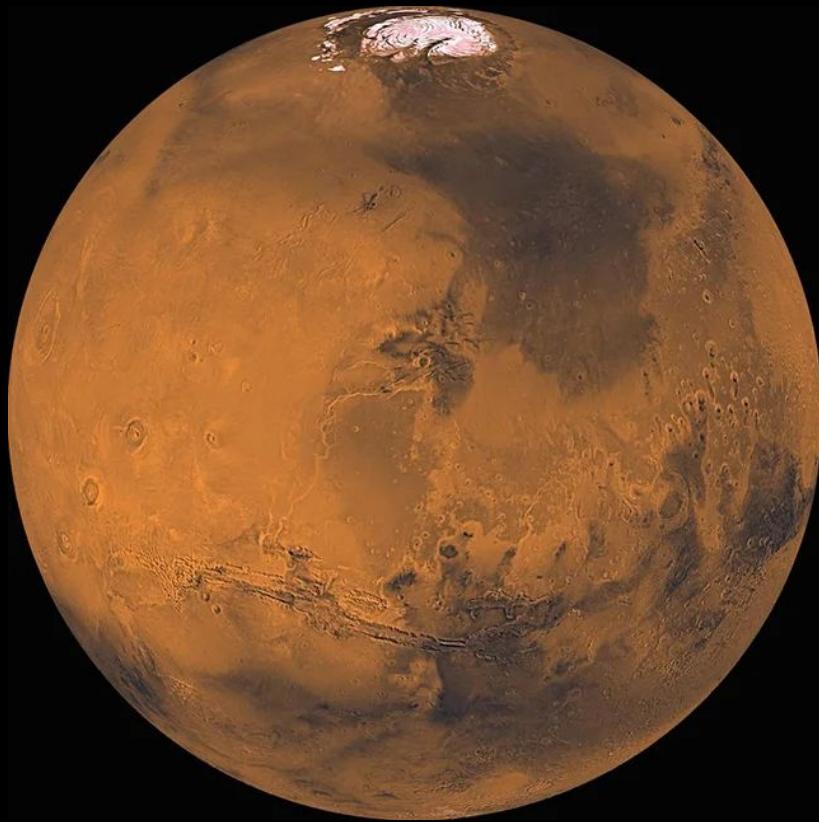
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2. Methodology
 - i. Comprehensive, high-res crater field data
 - ii. Finding the “dips”
3. Discussion
 - i. Puzzling results
 - ii. Compelling examples
 - iii. Future work

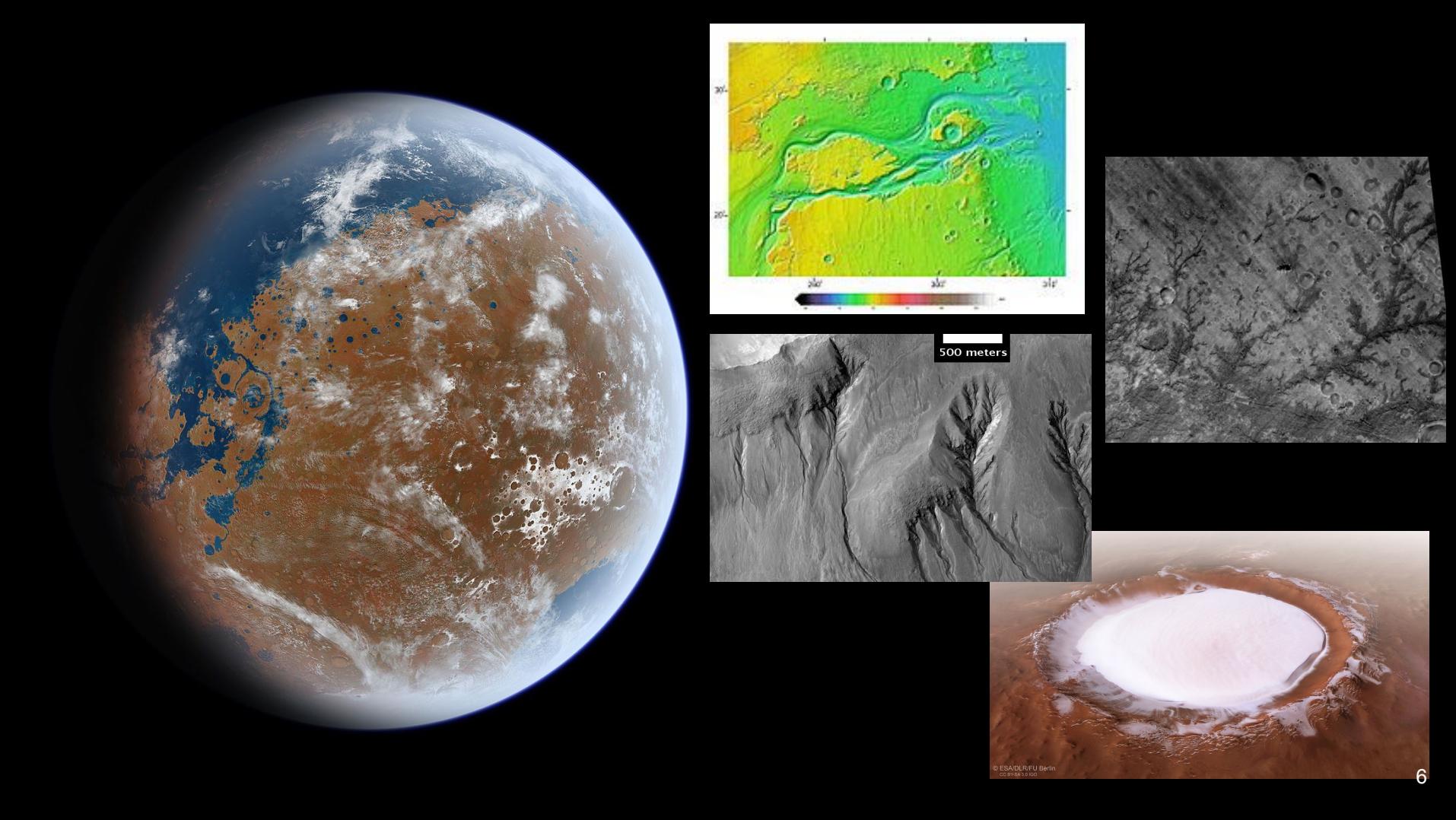
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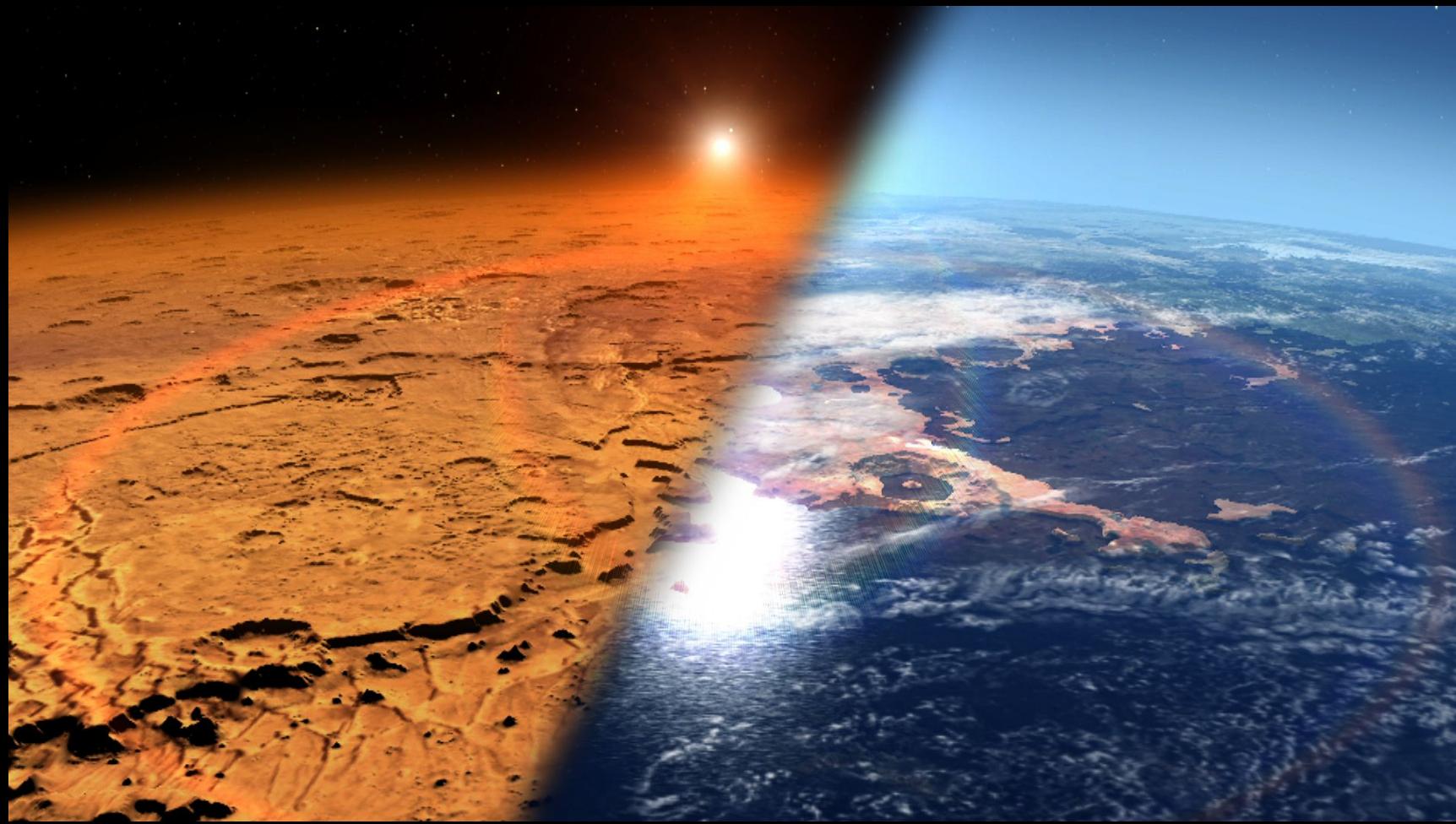
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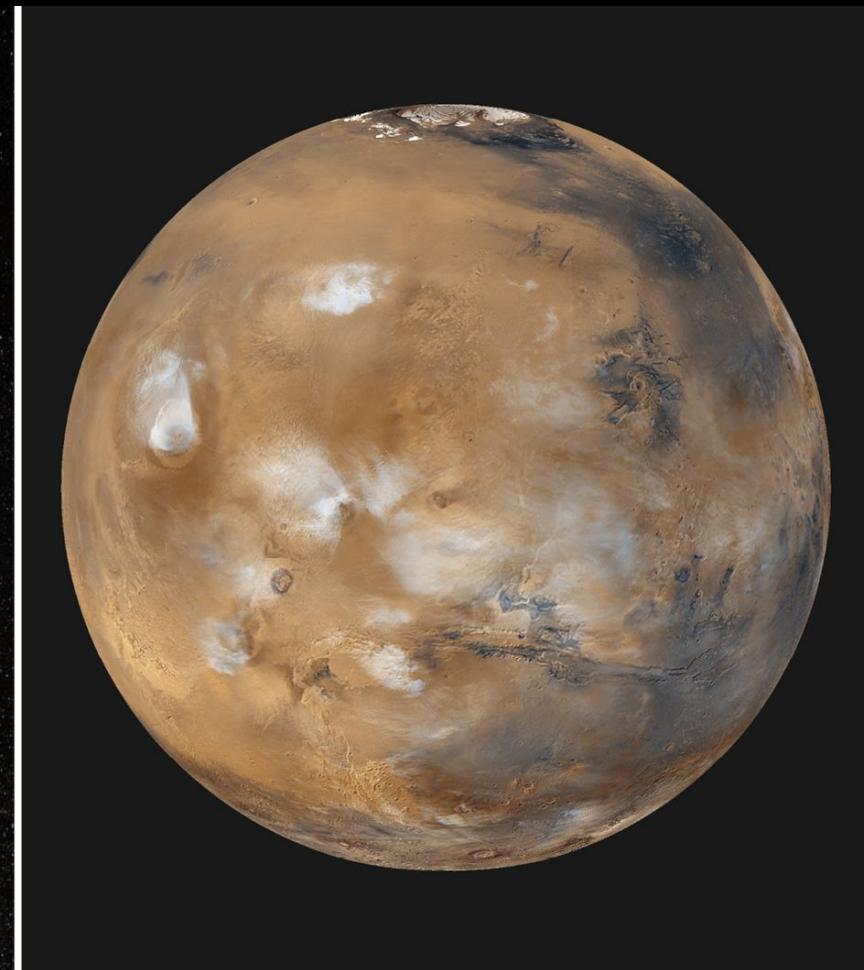
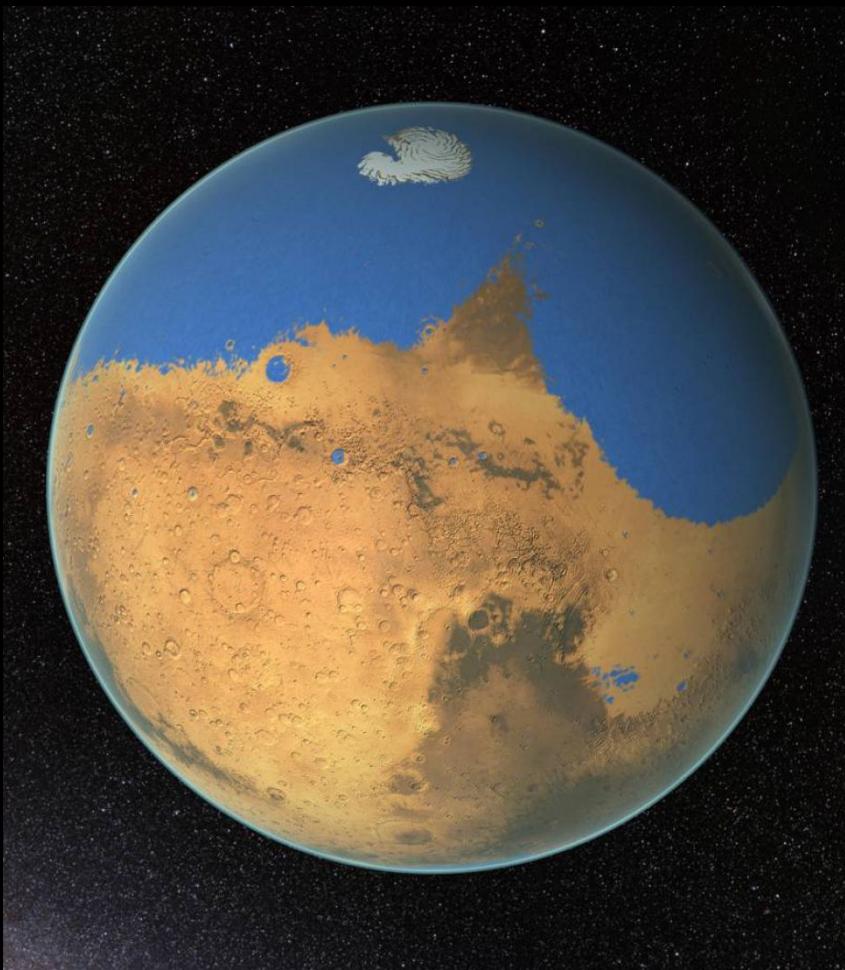
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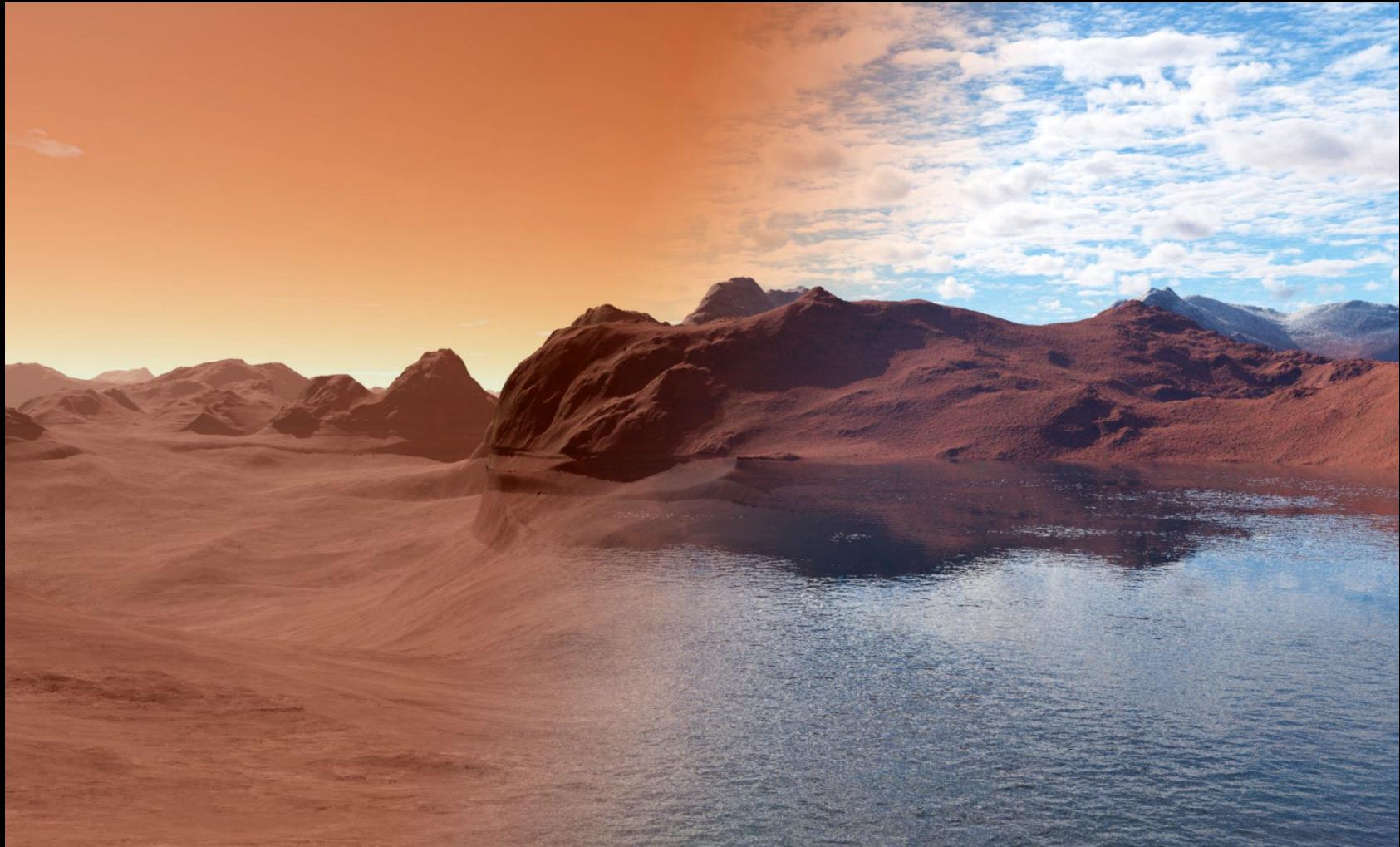
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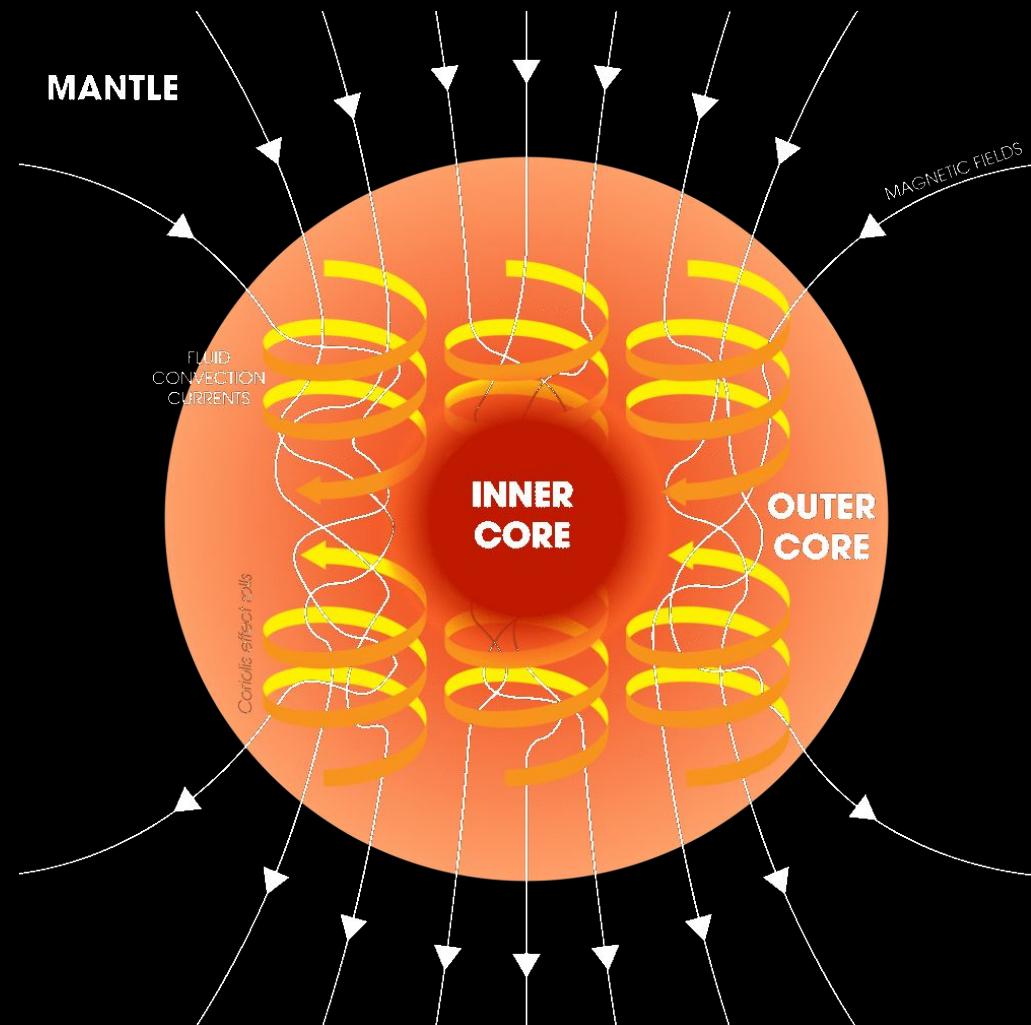




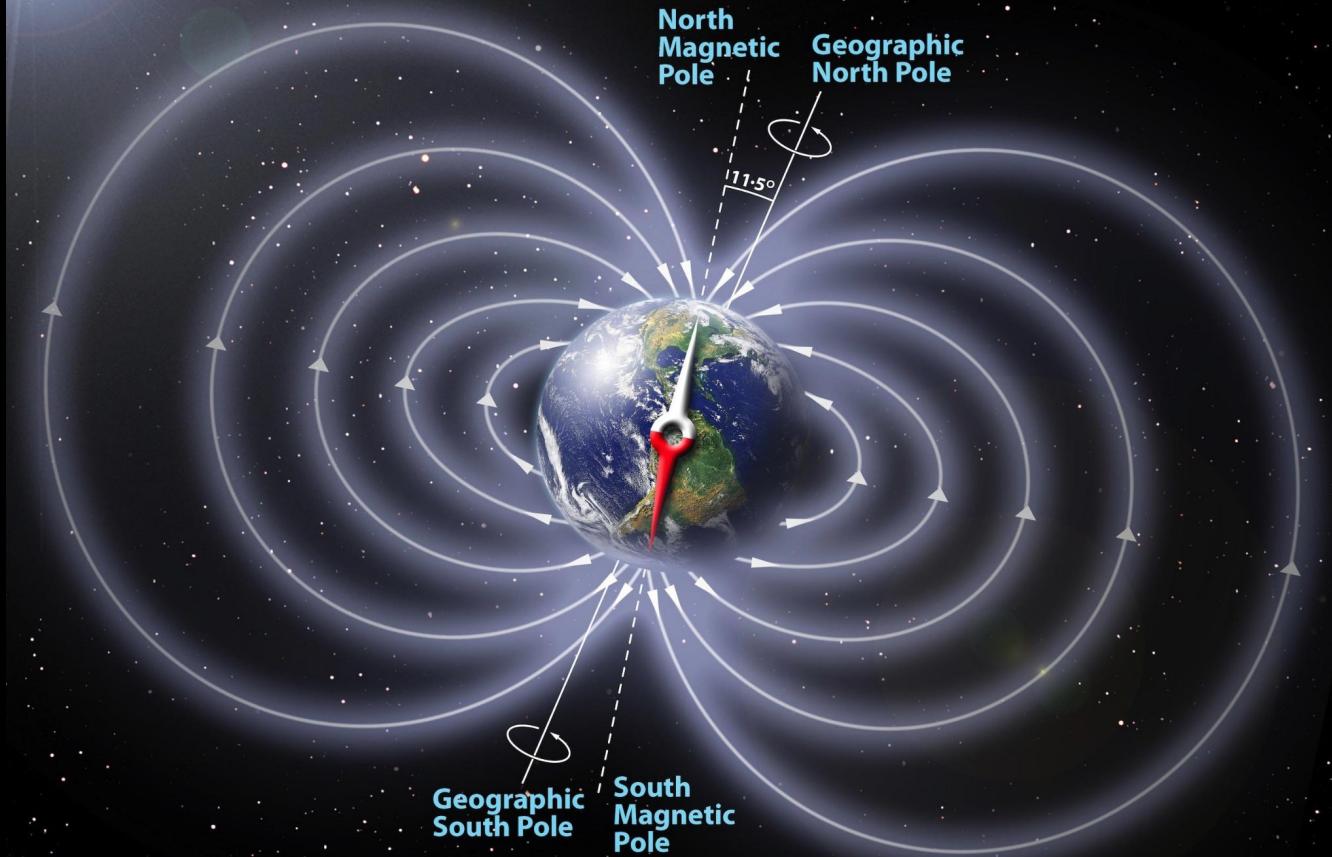


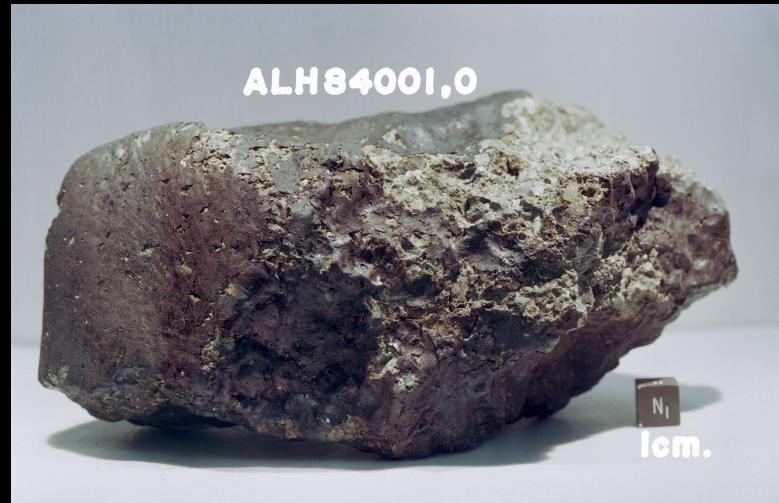
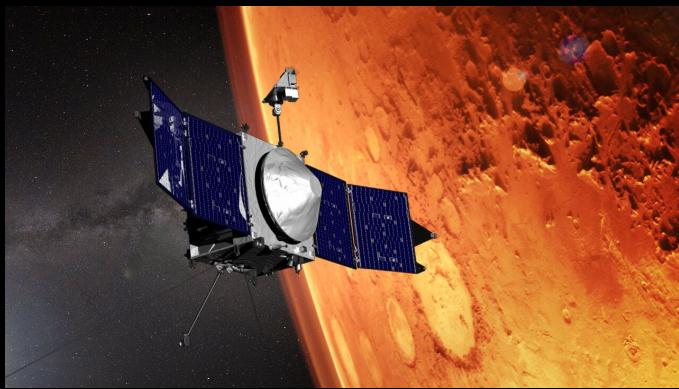


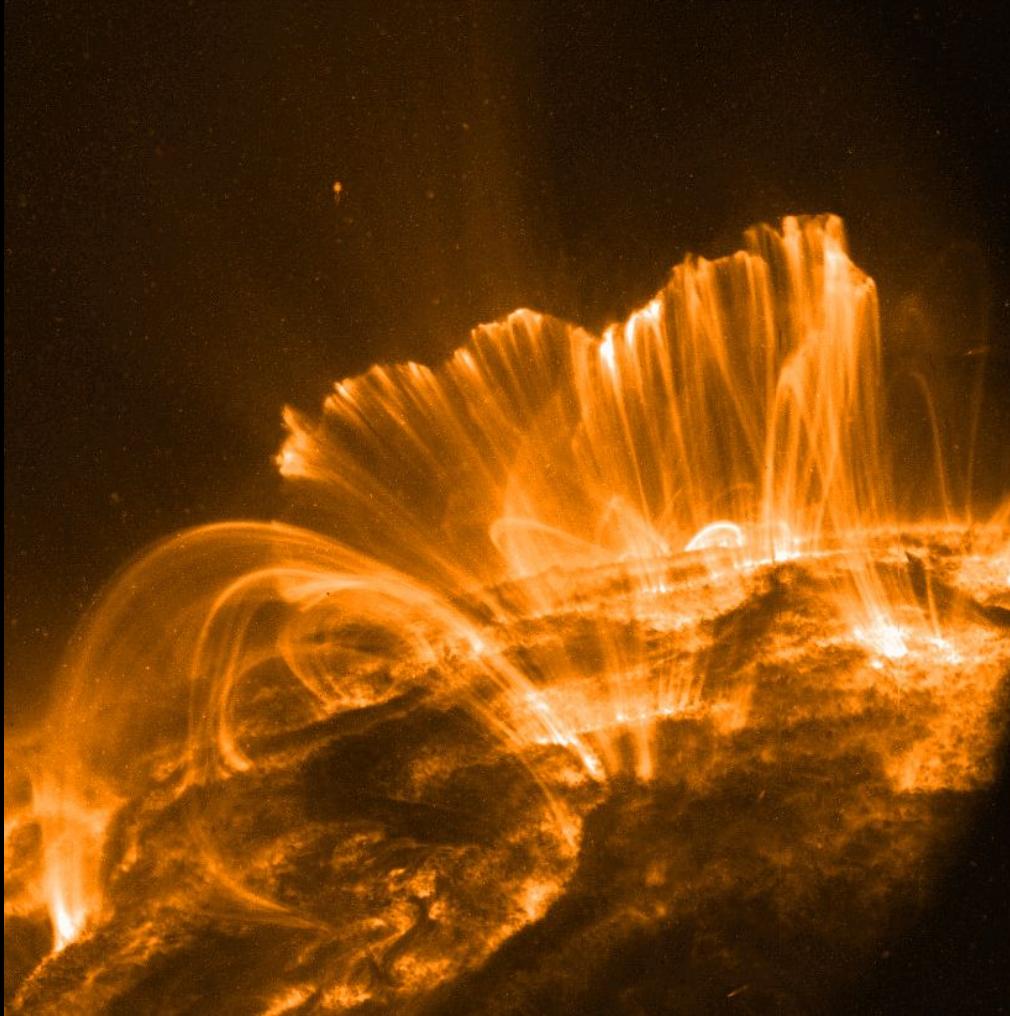
“Dynamo Theory”

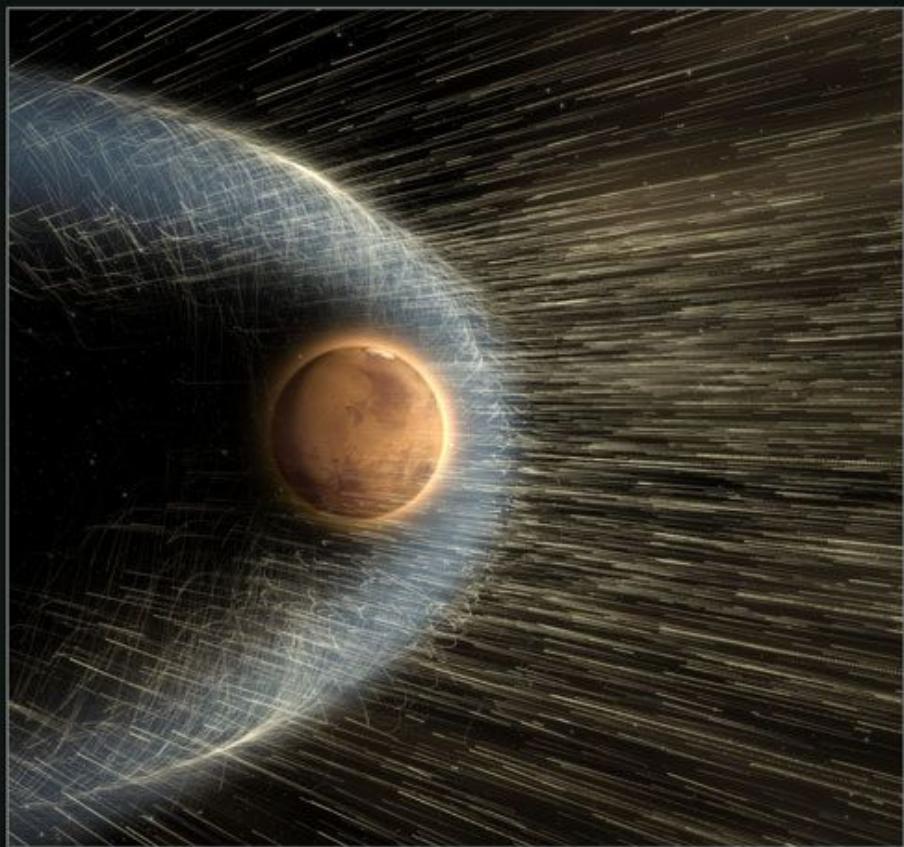
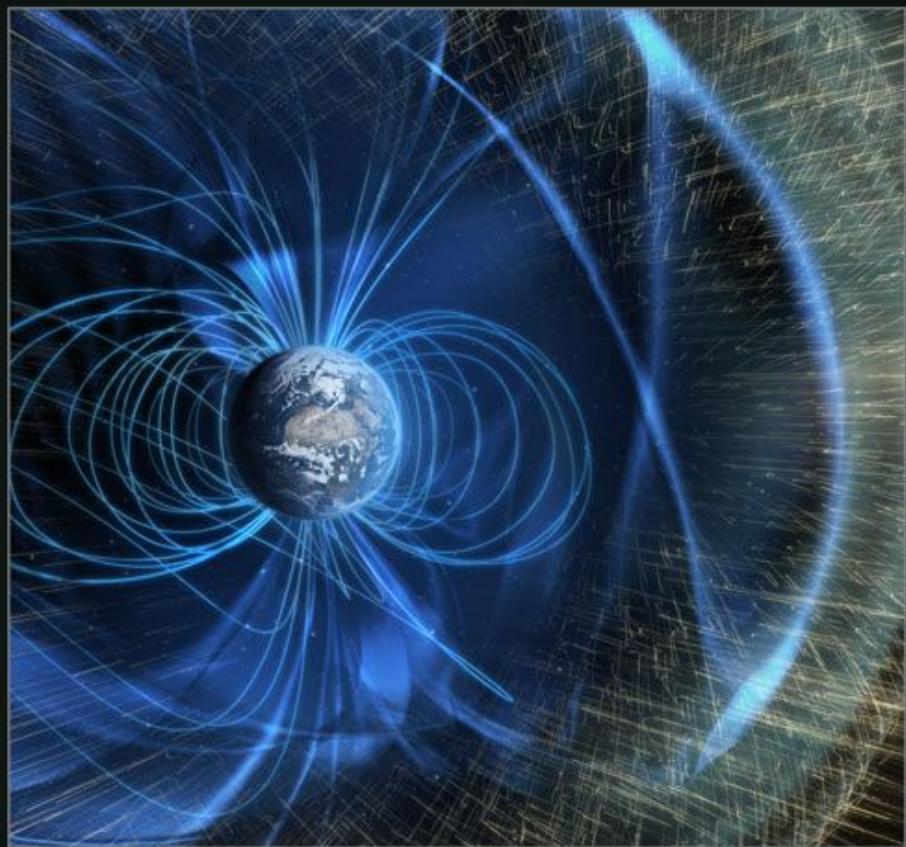


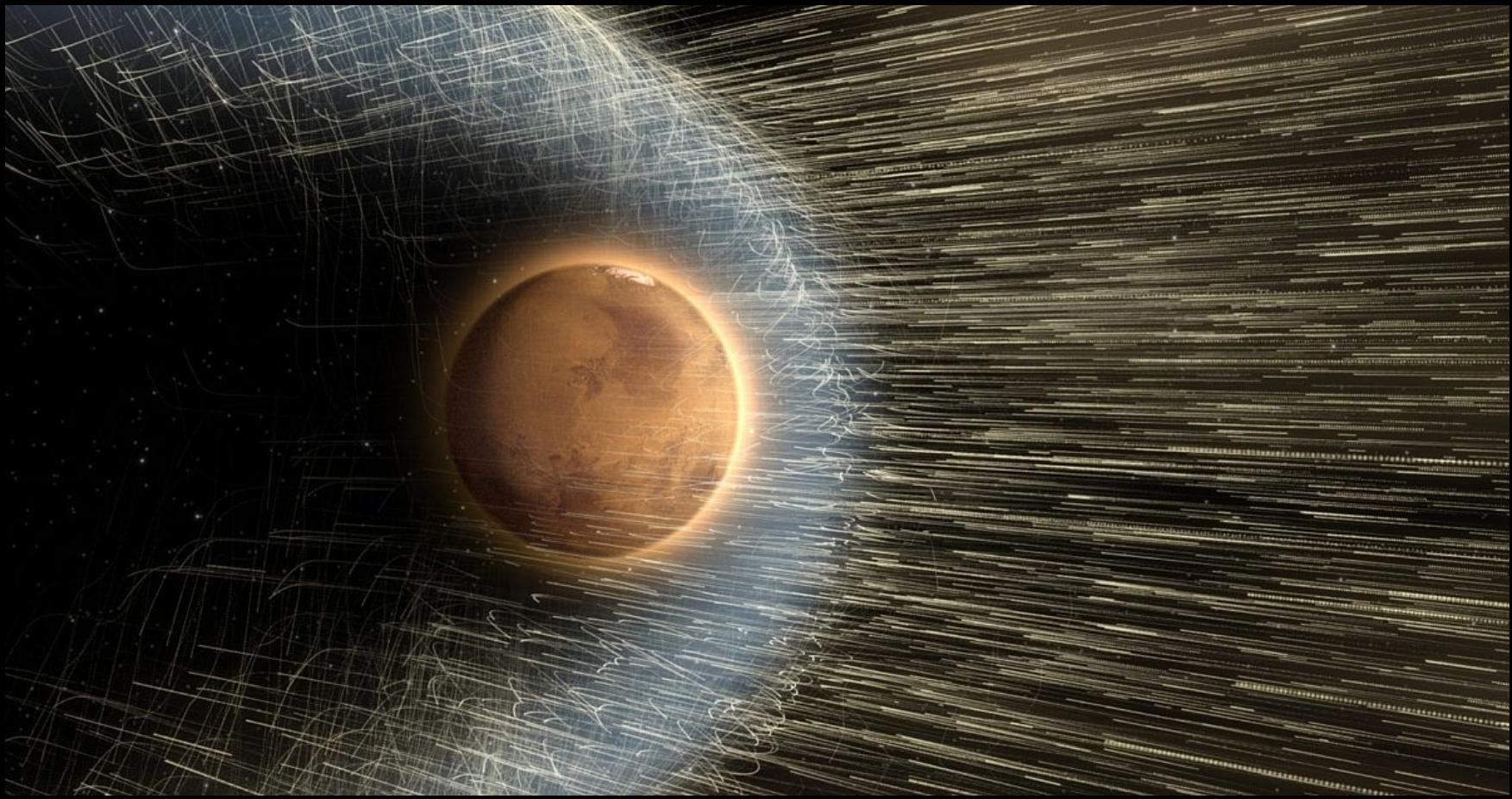
The Earth's Magnetic Field

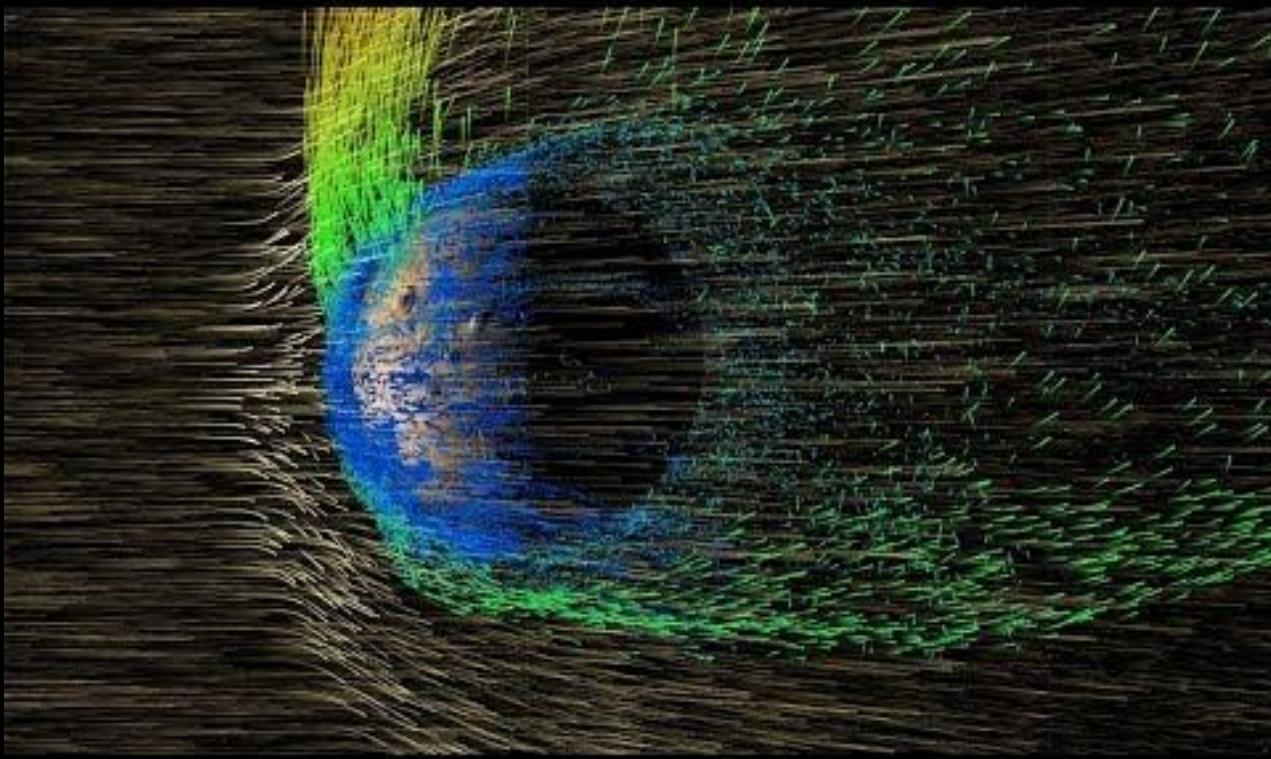


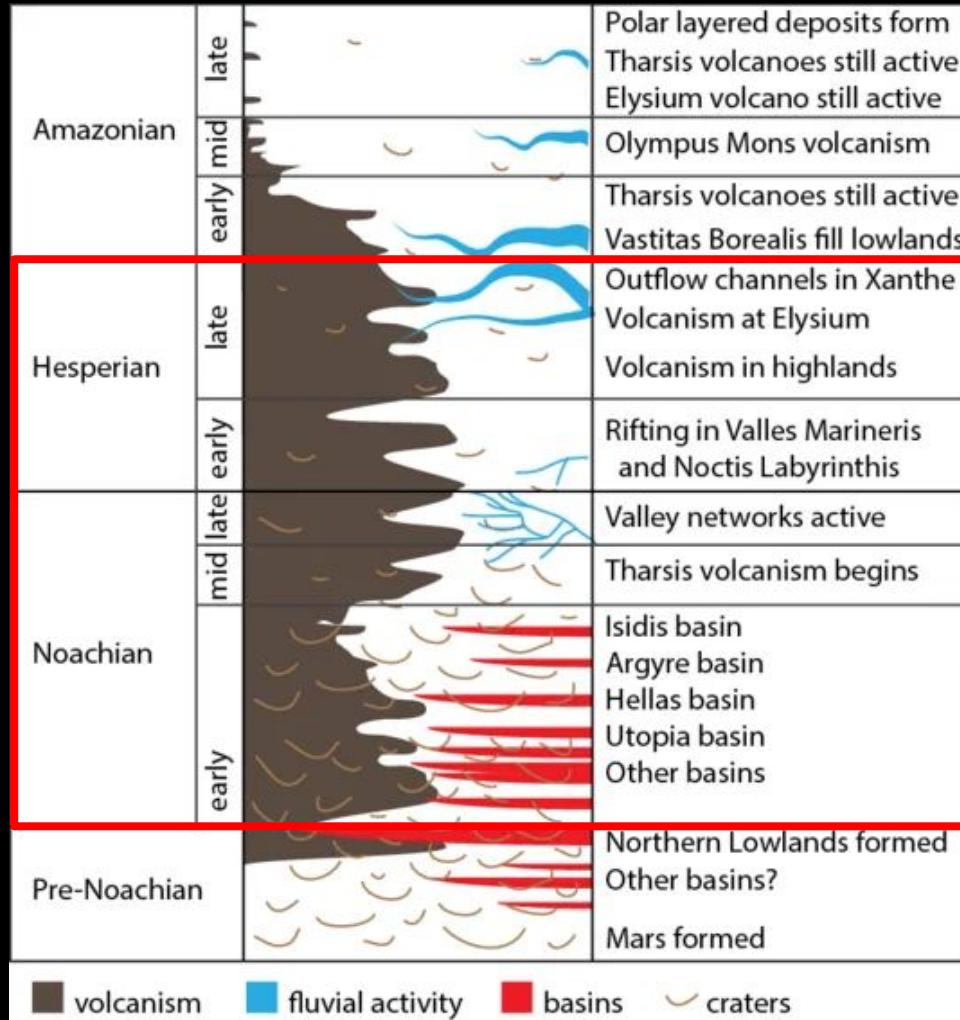






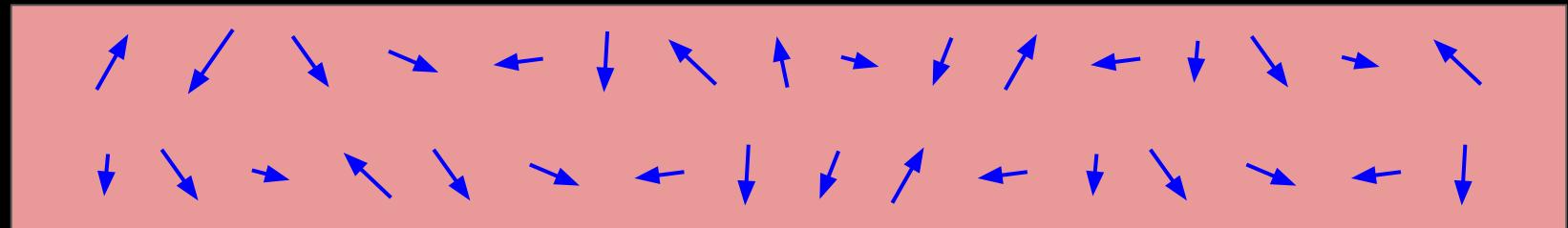




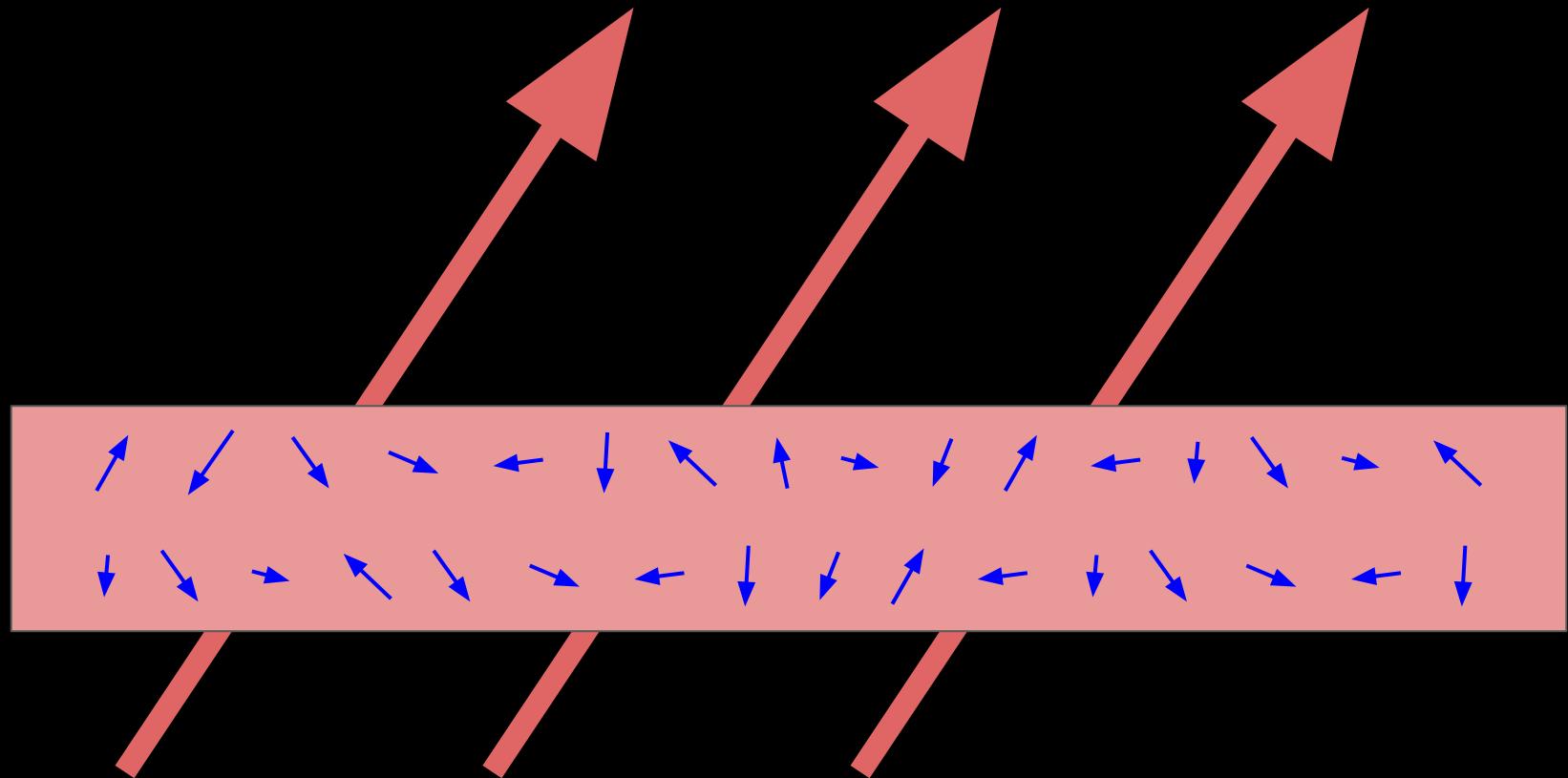


How do we figure out when the
dynamo died?

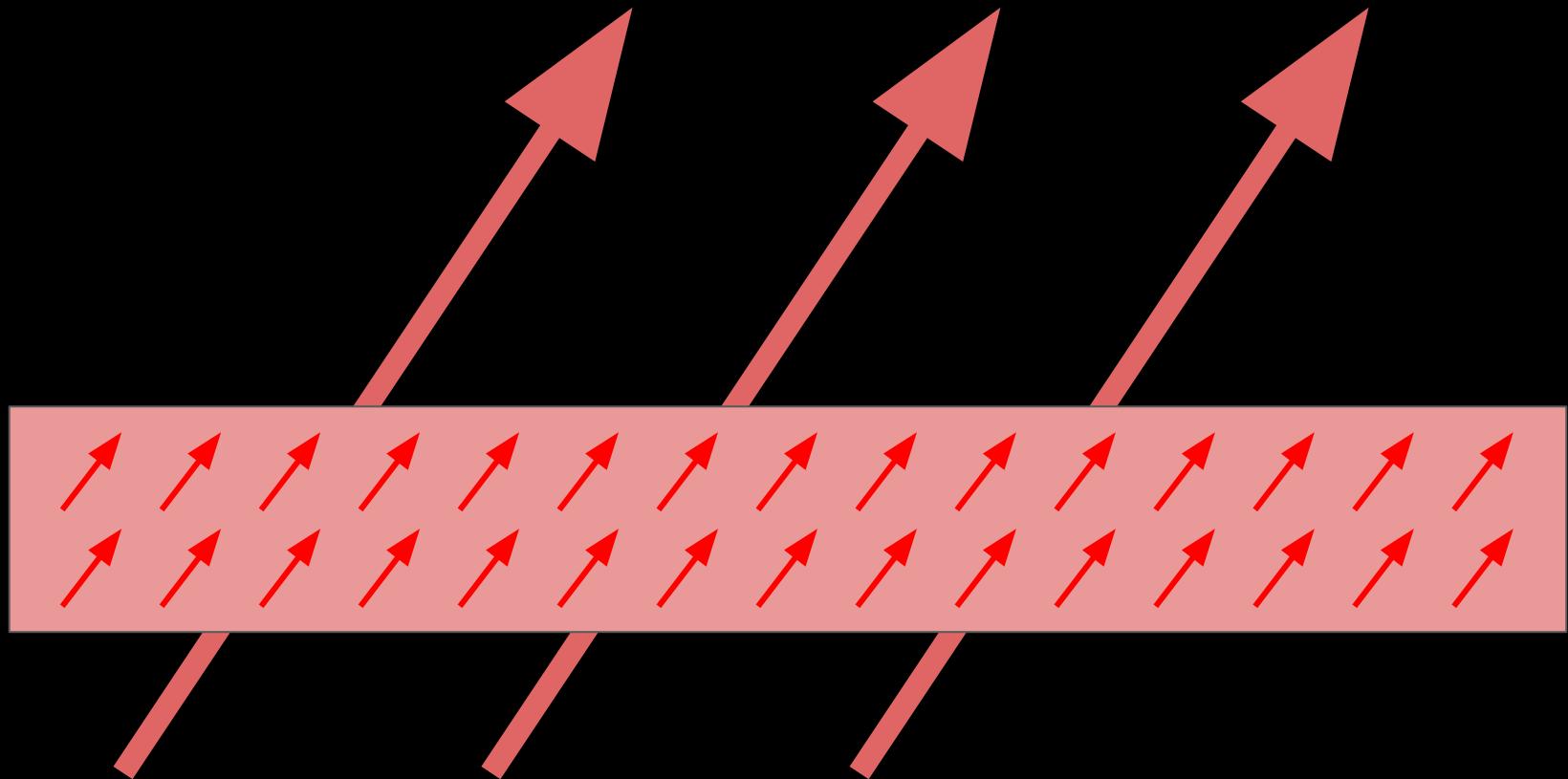
Formation of Crust



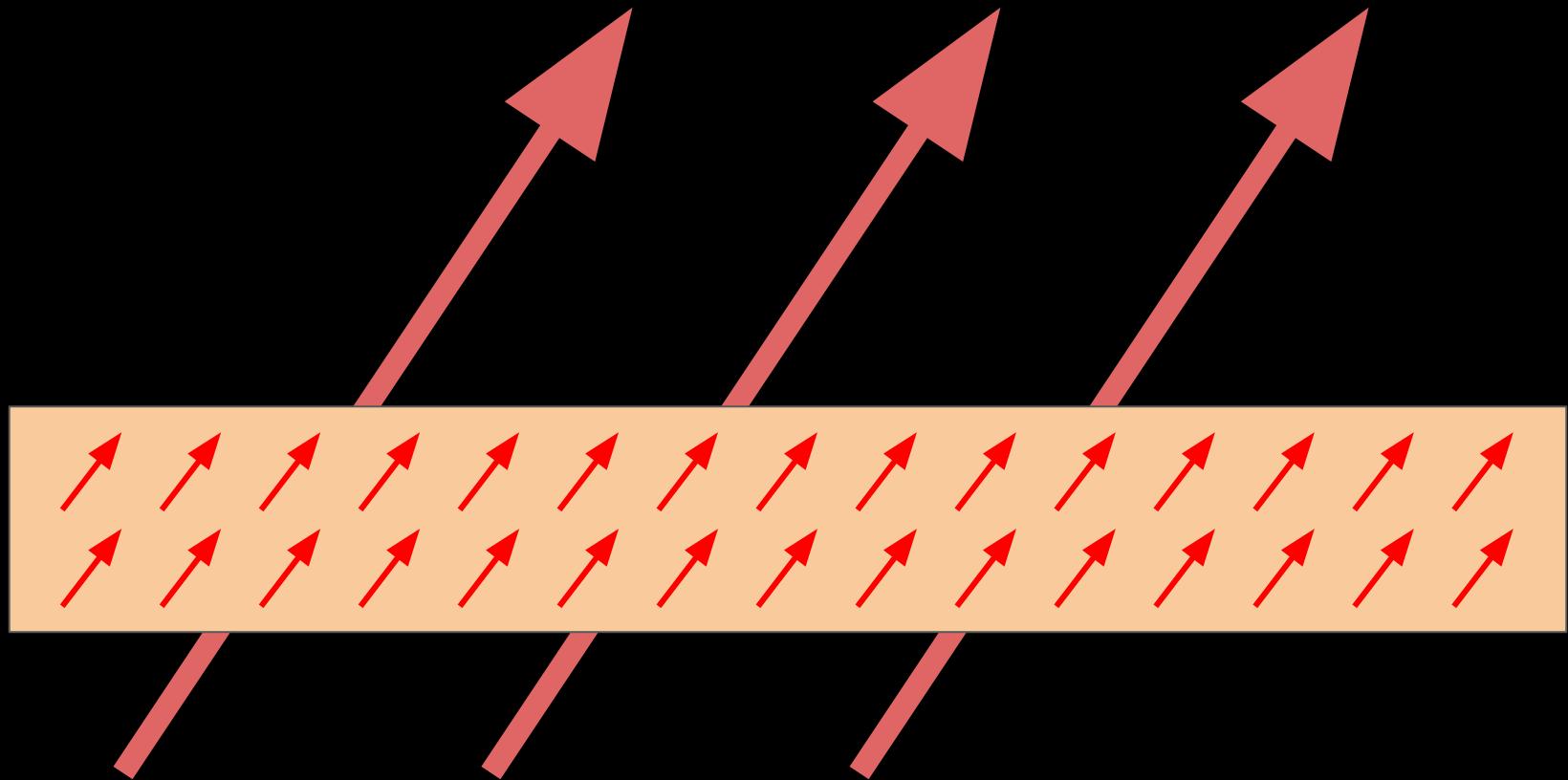
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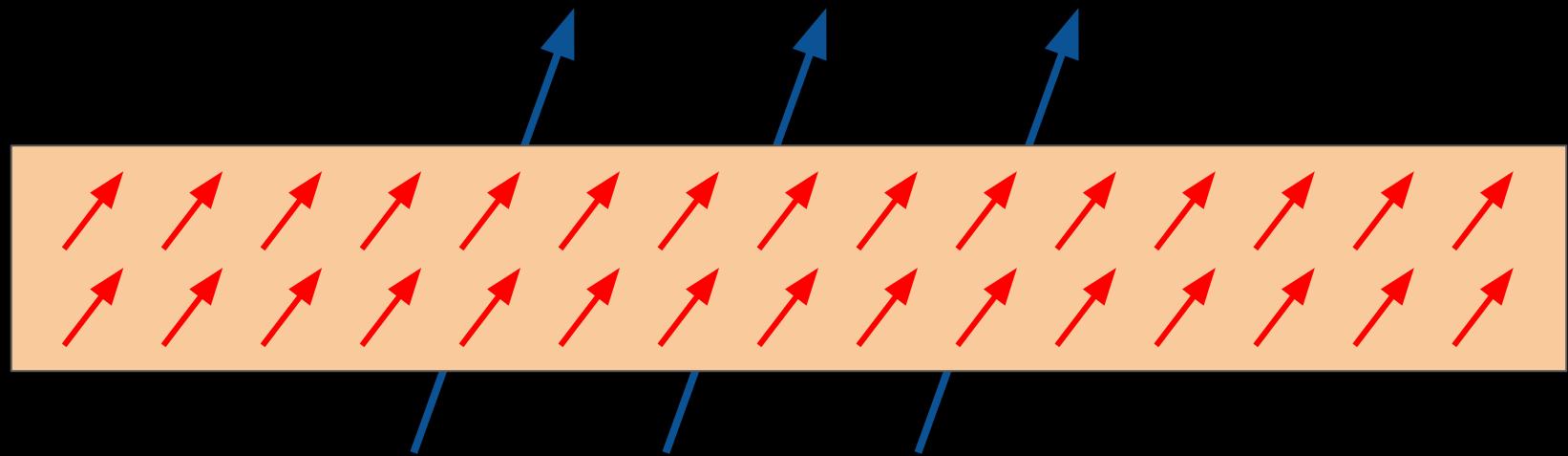
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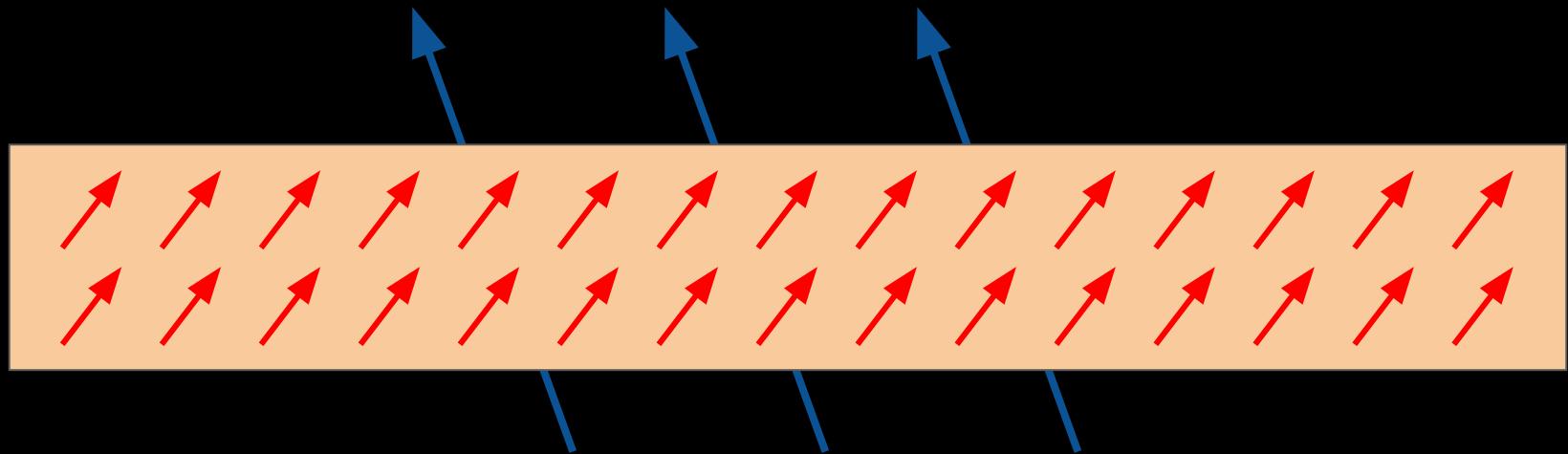
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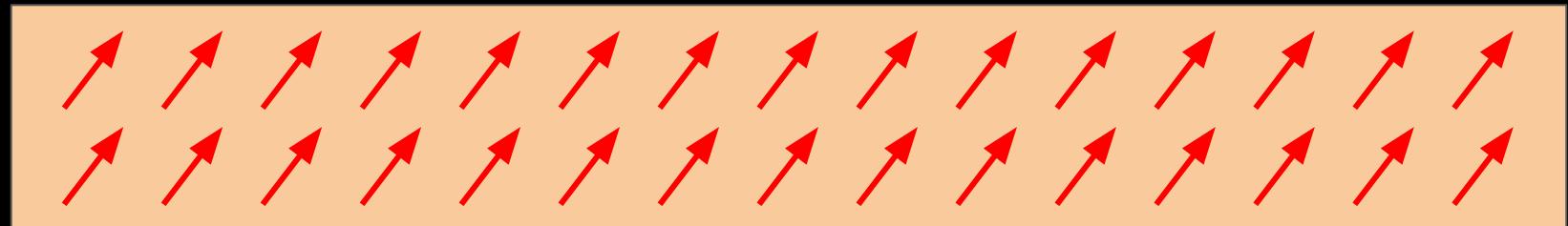
Formation of Crust



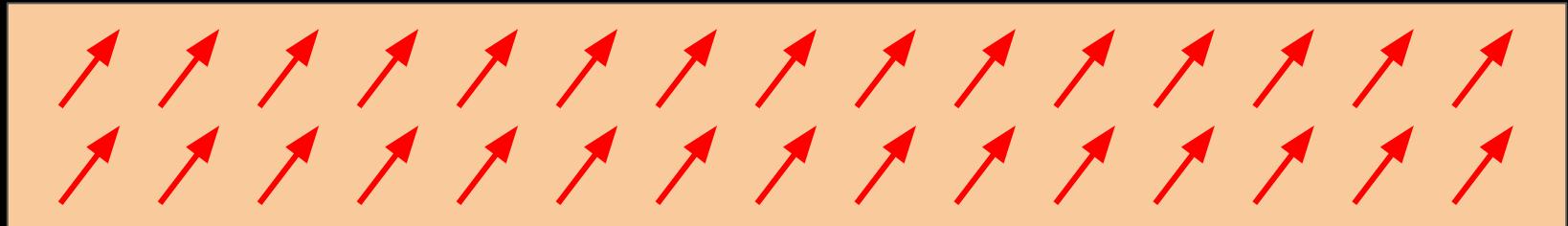
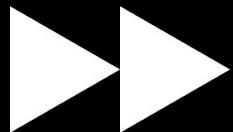
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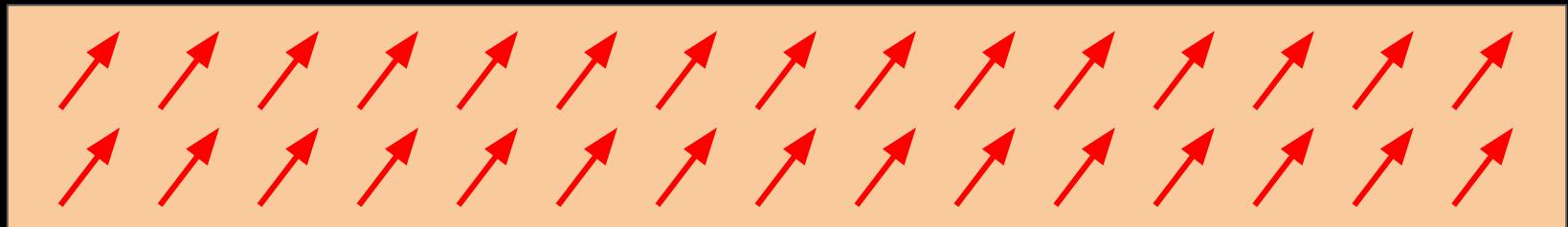
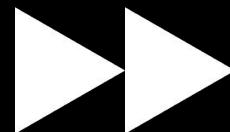
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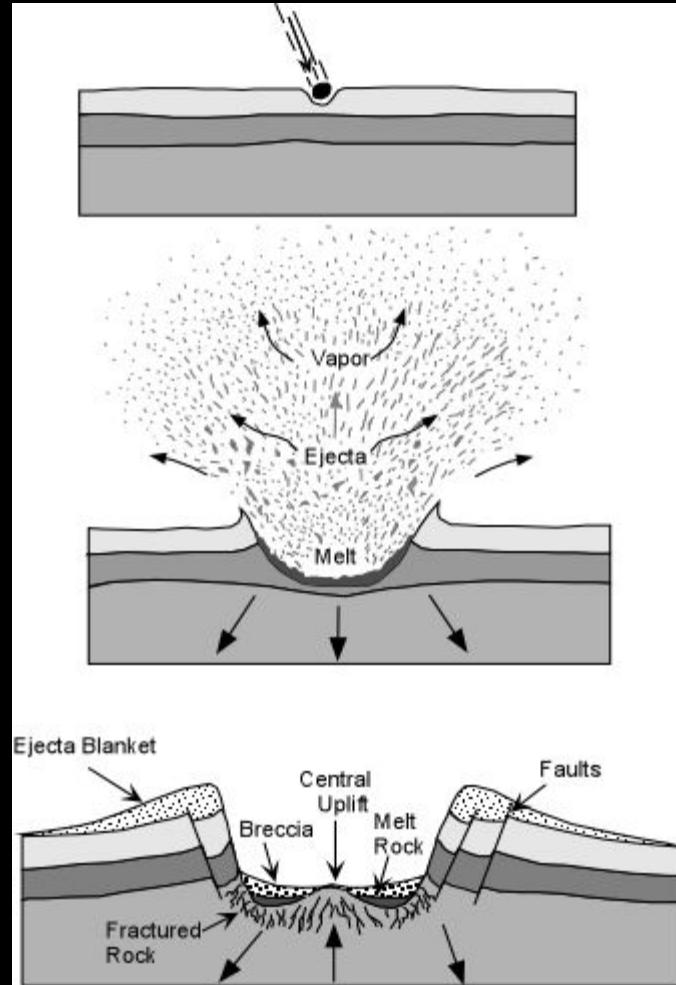


Formation of Crust

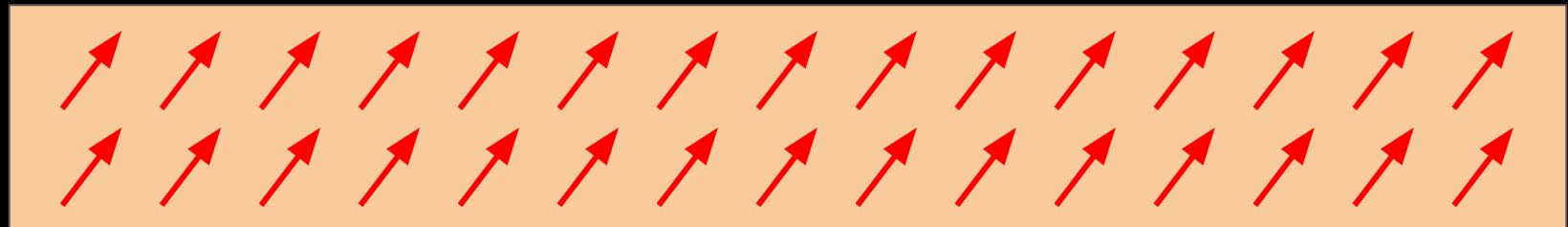


Impact Event

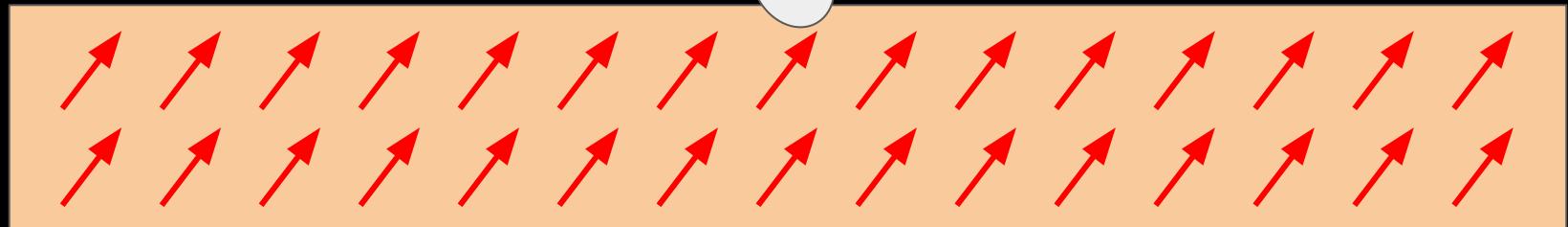
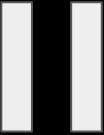




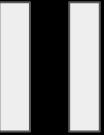
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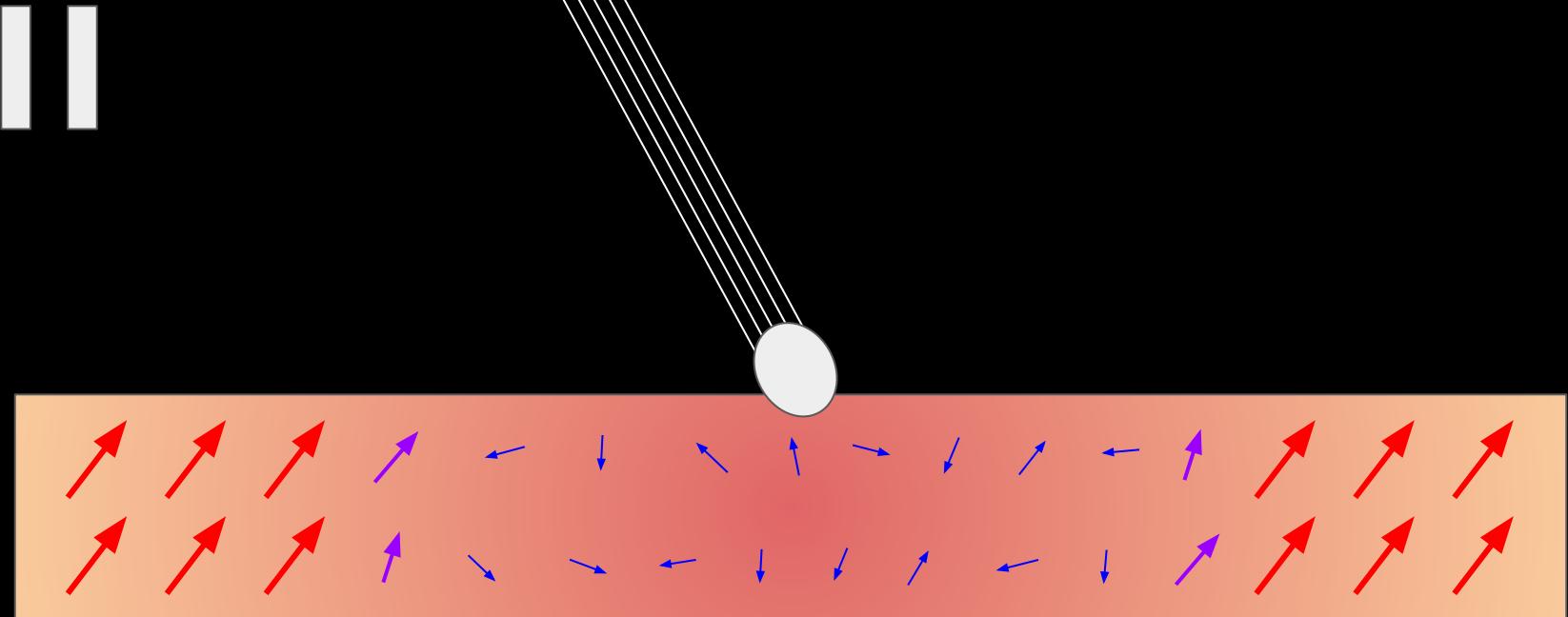
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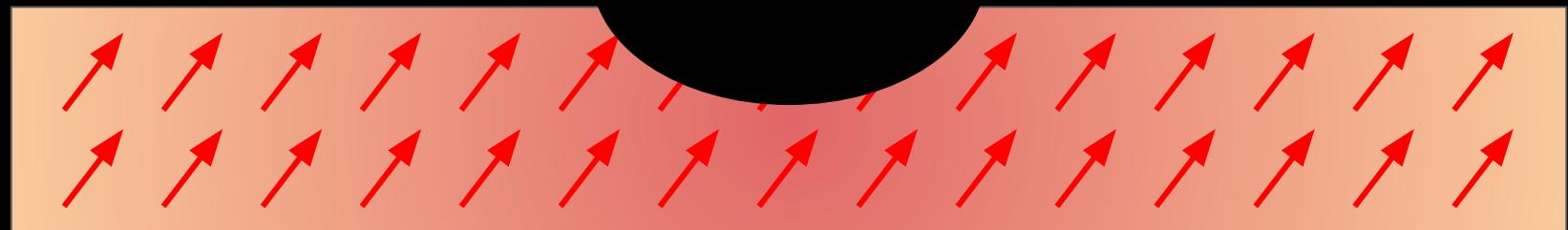
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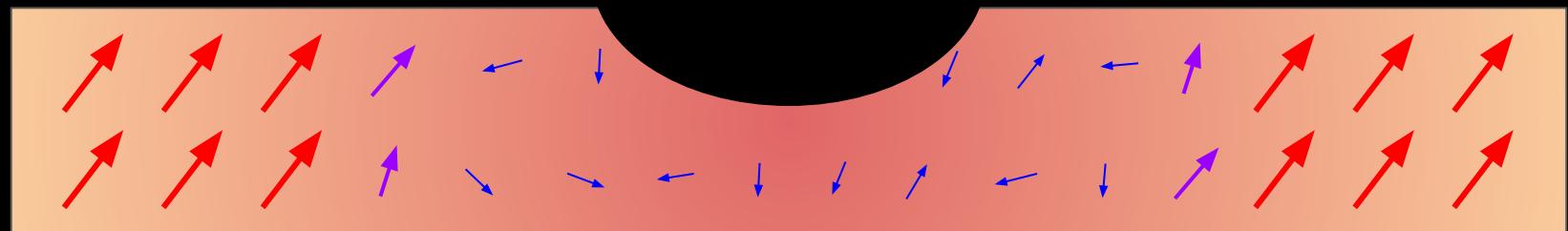
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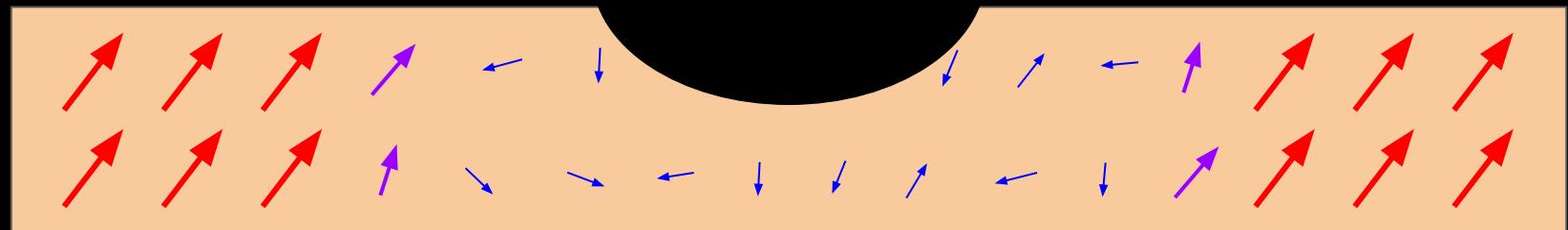
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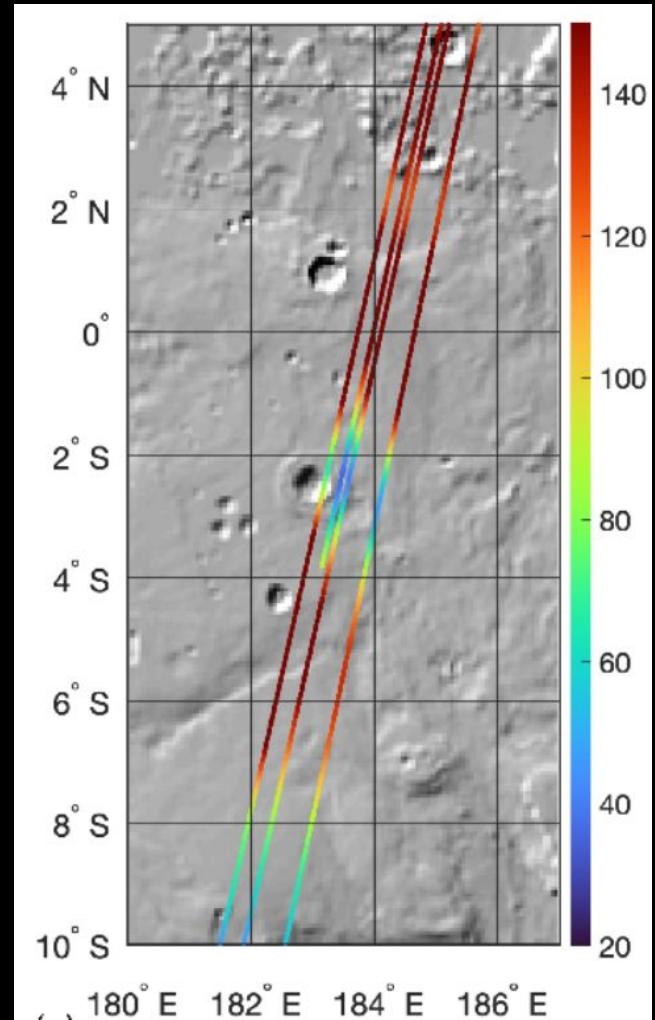


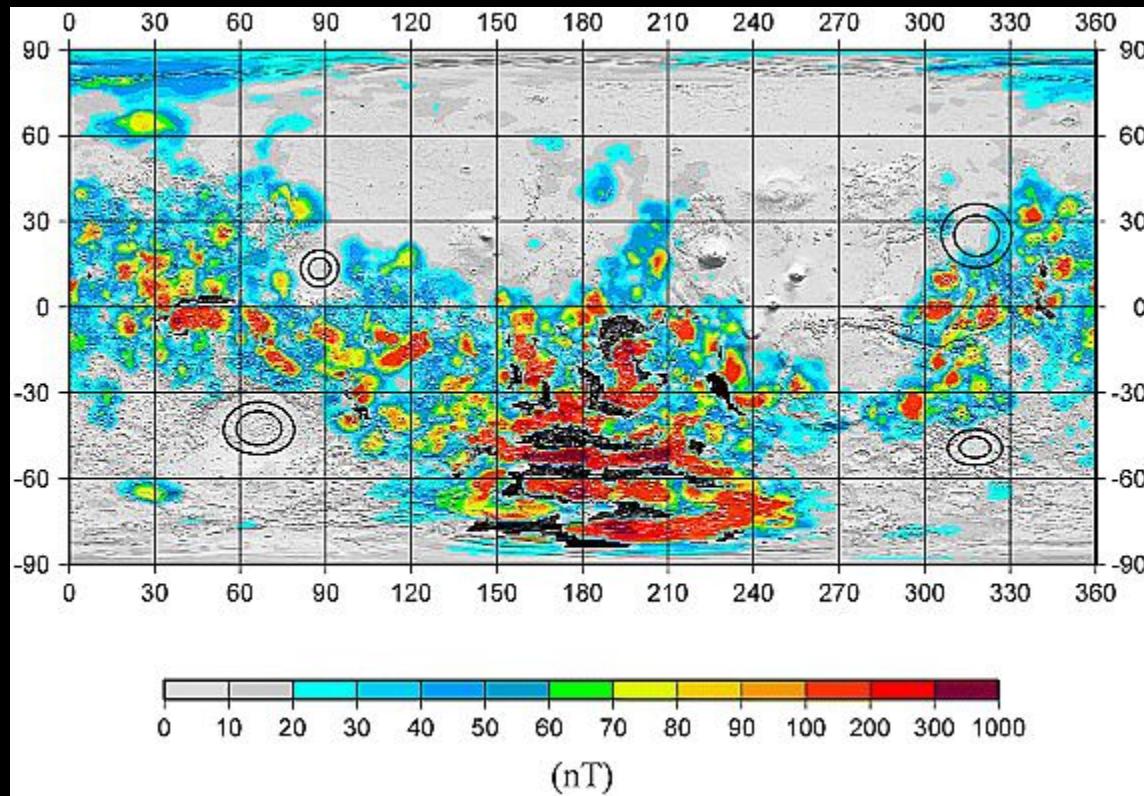
Impact Event



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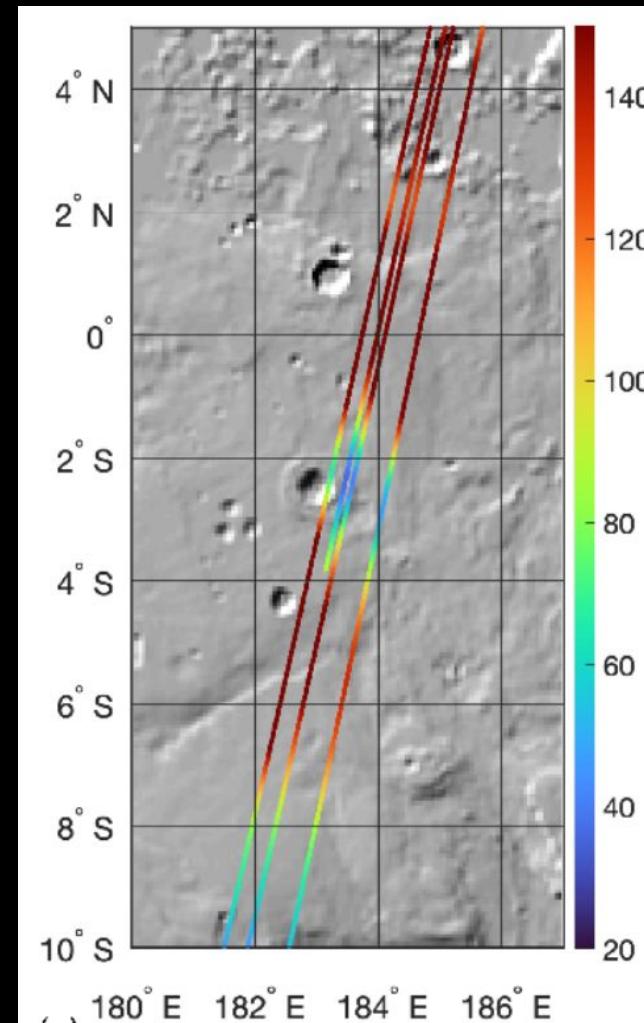
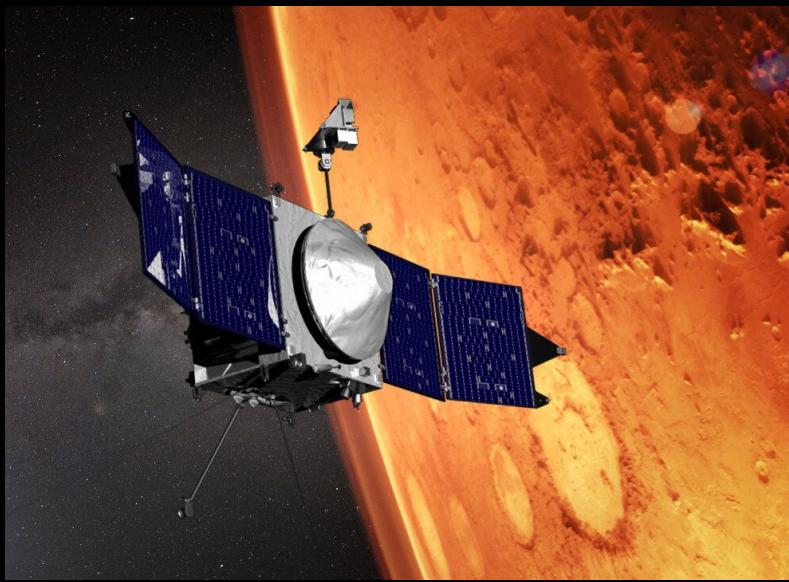


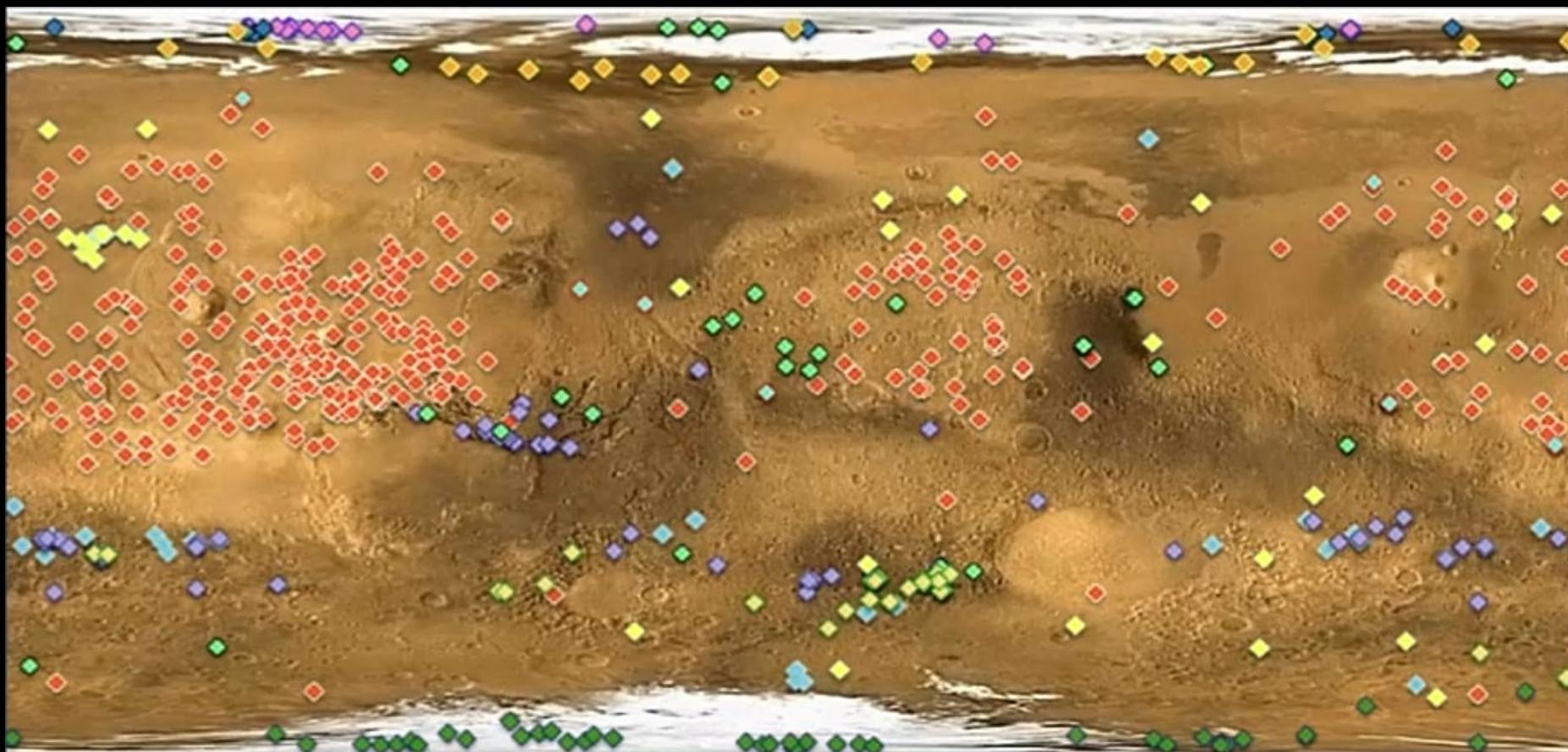


Shahnas and Arkani-Hamed 2007

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$$|B|$$

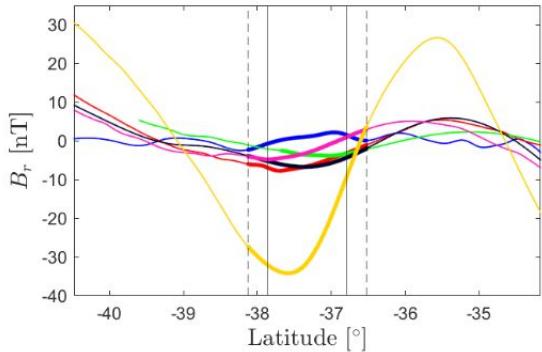
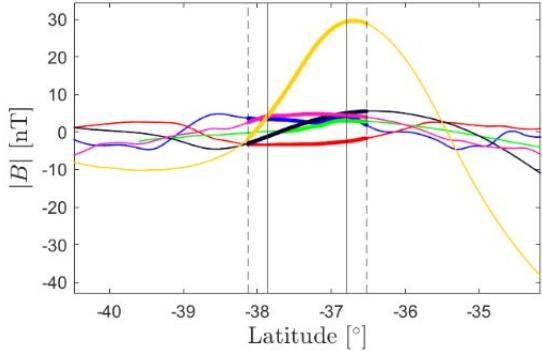
$$||B||$$

Altitude

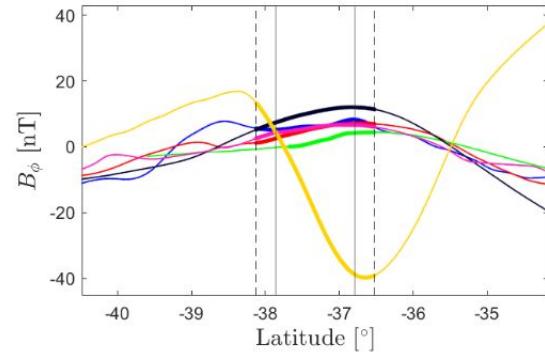
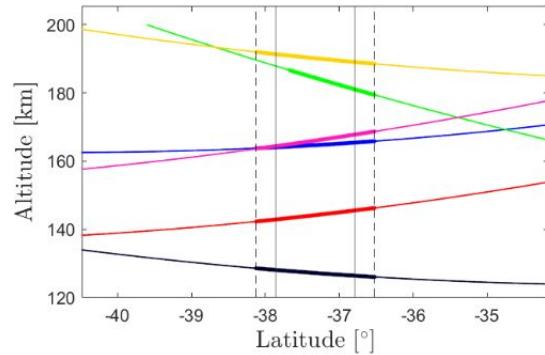
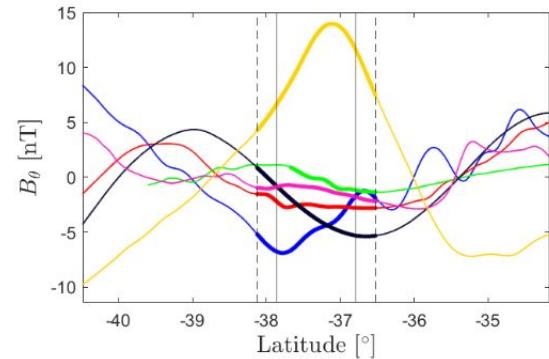
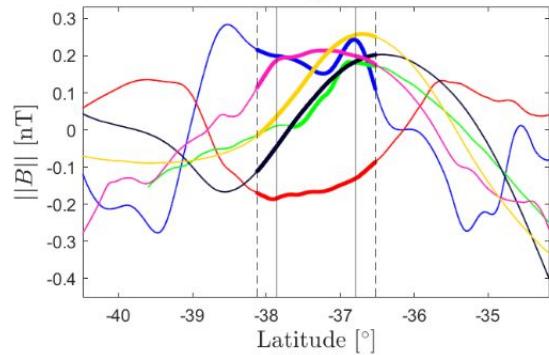
$$B_r$$

$$B_\theta$$

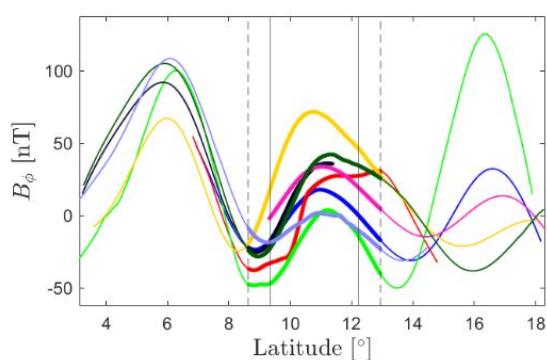
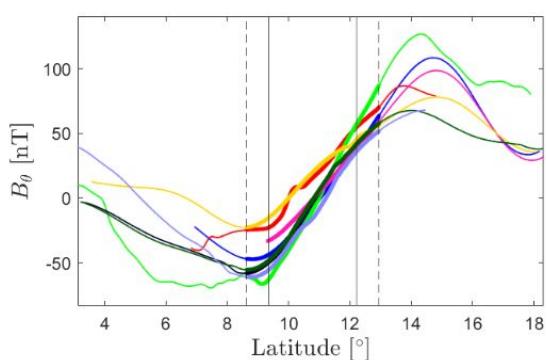
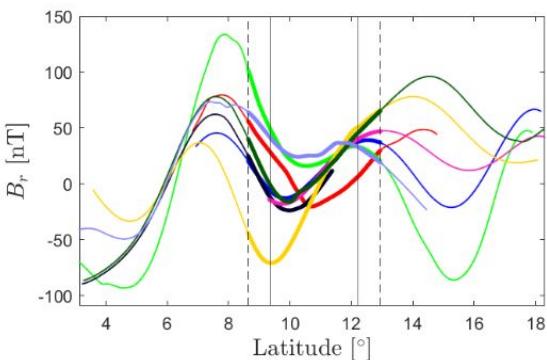
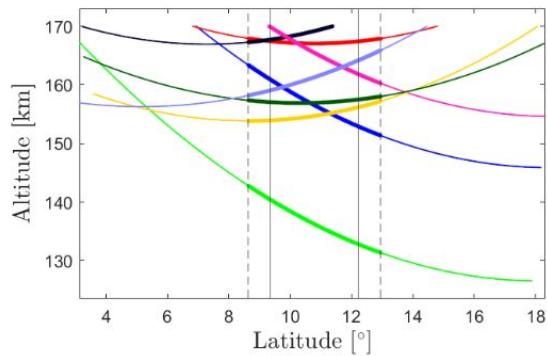
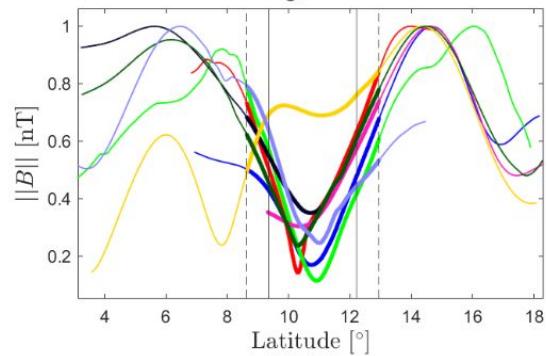
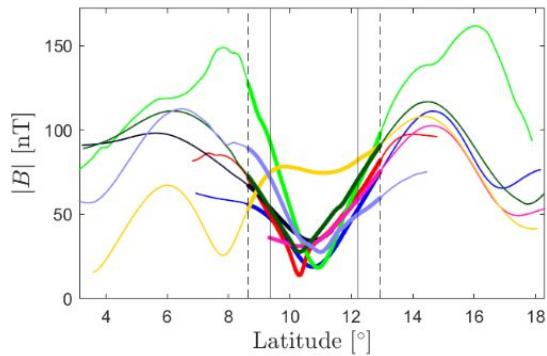
$$B_\phi$$

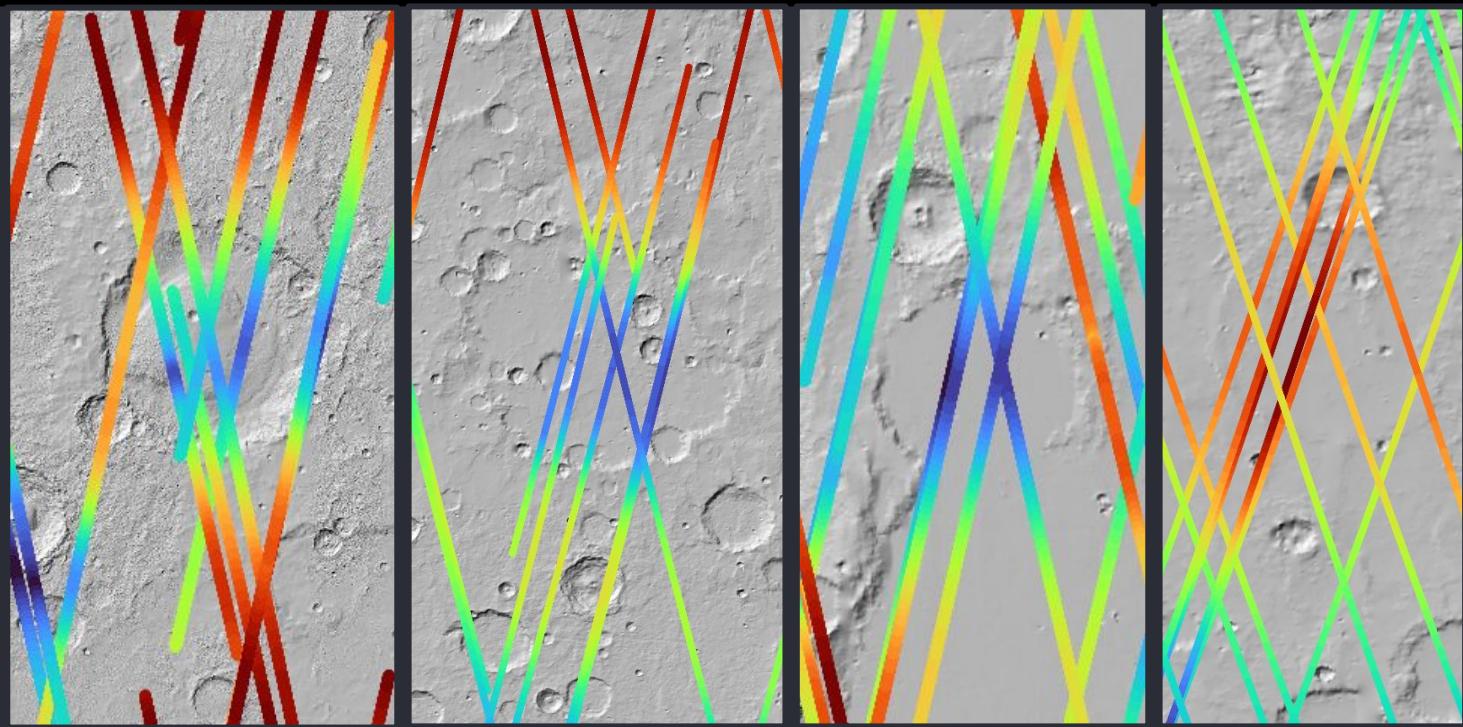


Crater #0012 (ID: 11-1-016991)
 Coordinates = (41.4, -37.3), Diameter = 70.53km
 Linear Detrending, 6 Tracks

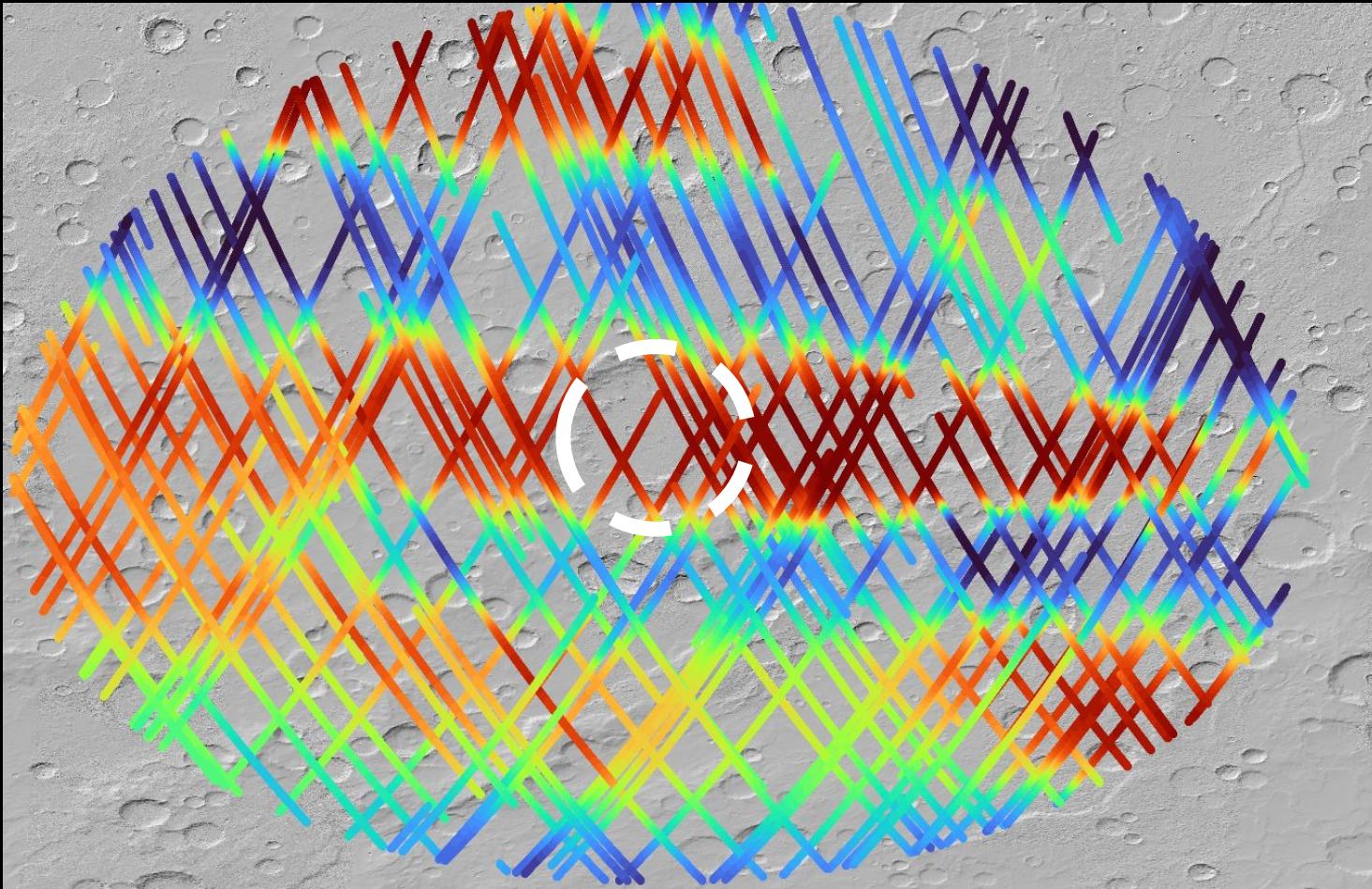


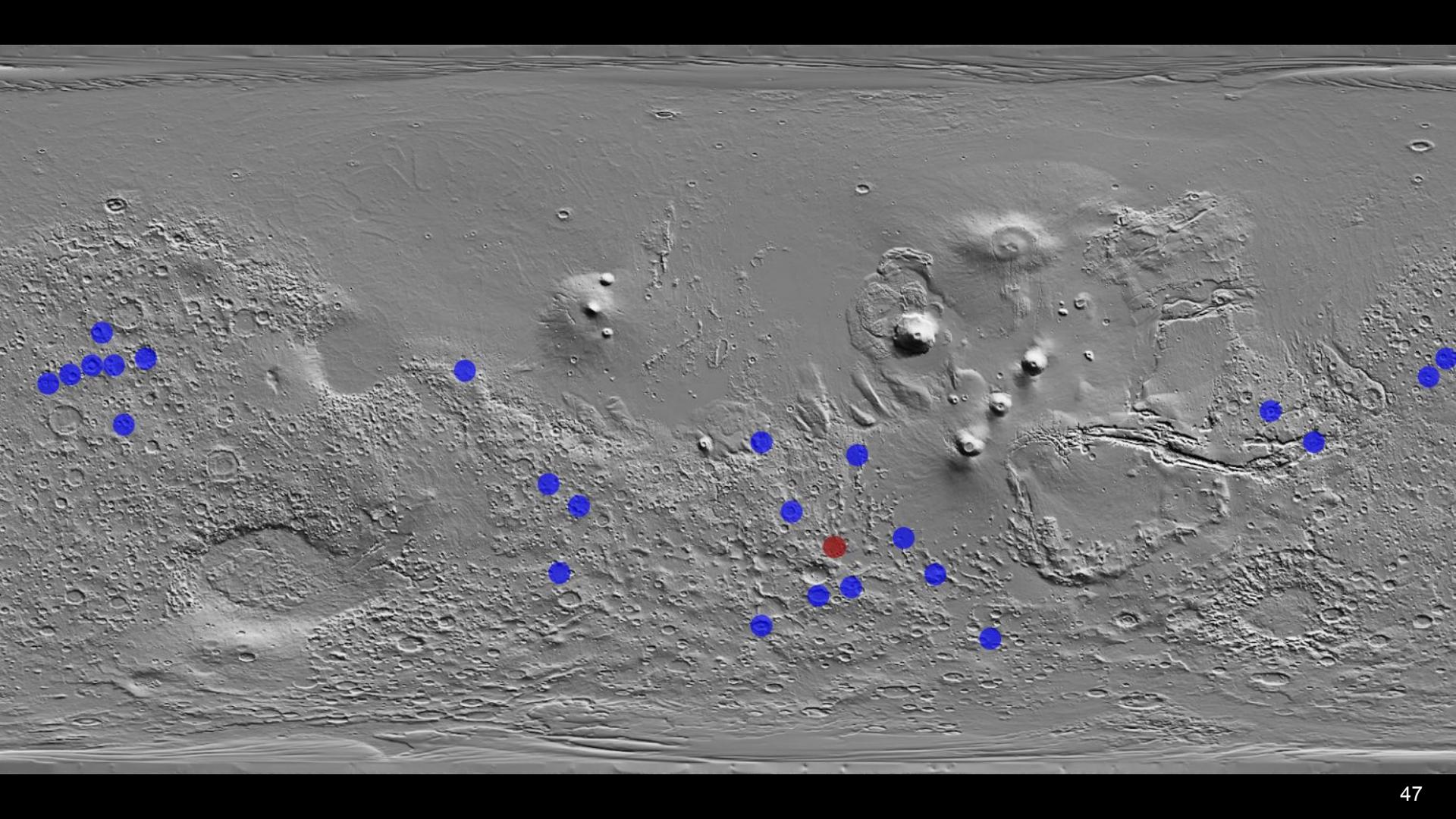
Crater #0027 (ID: 10-0-003901)
 Coordinates = (23.4, 10.8), Diameter = 167.58km
 No Detrending, 8 Tracks



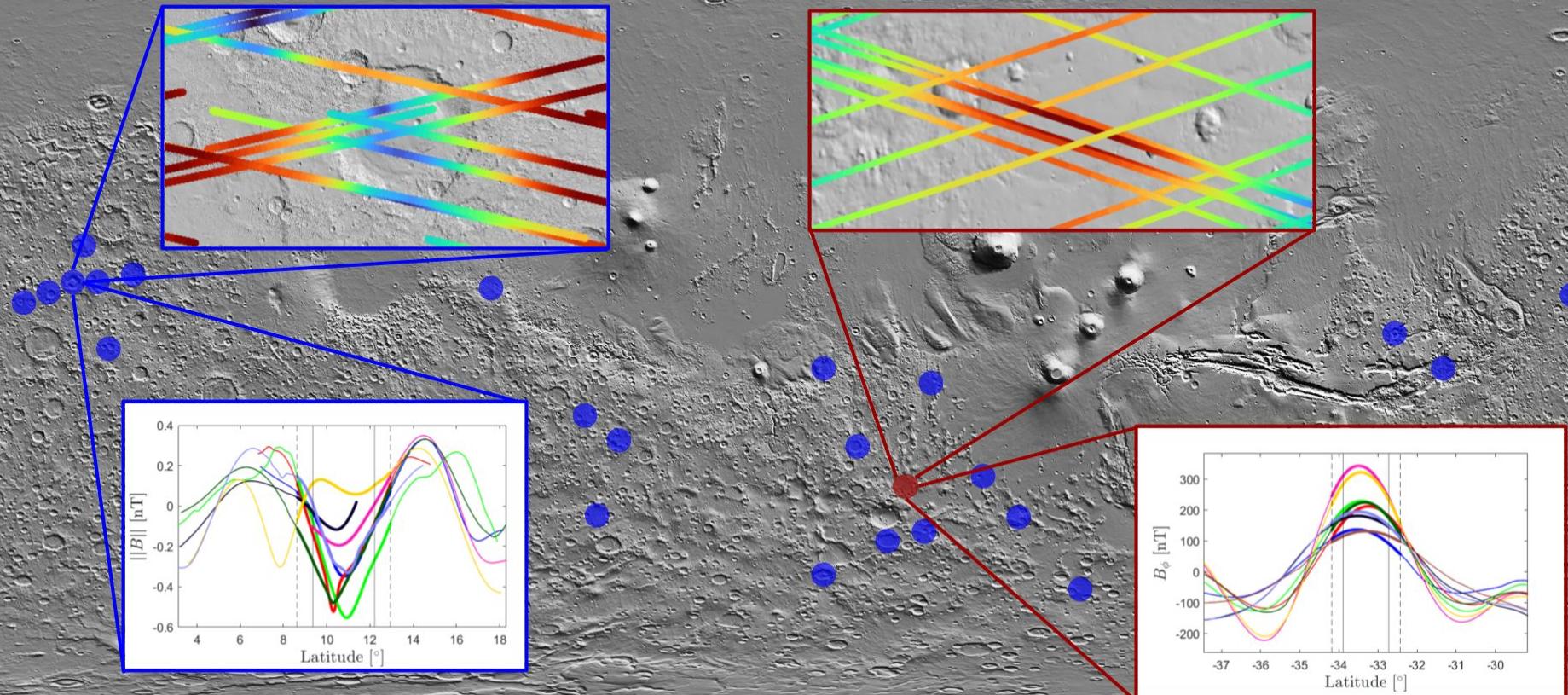


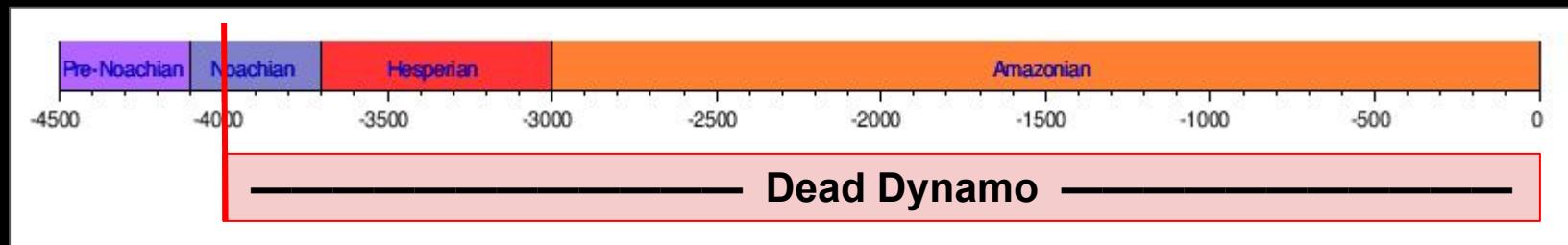






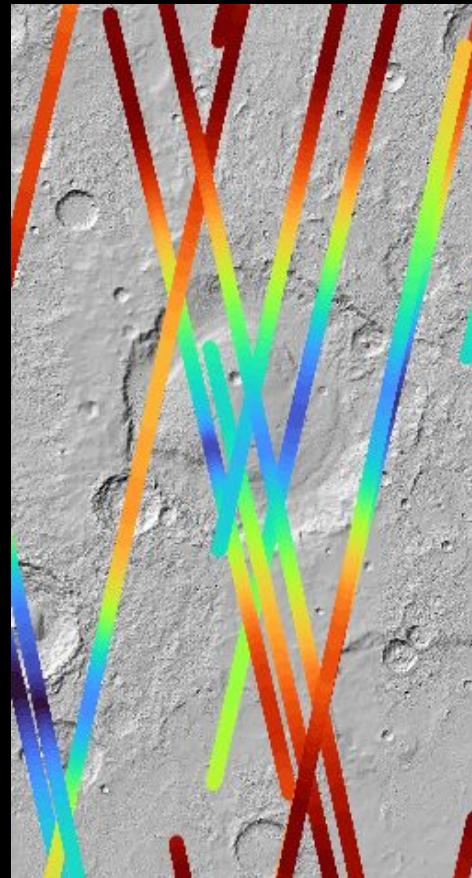
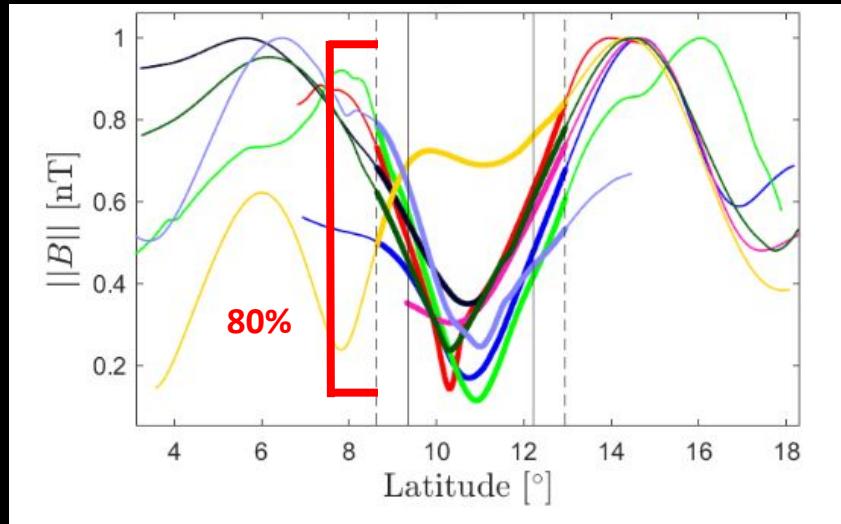
Impact-Induced Magnetic Anomalies in Martian Crust

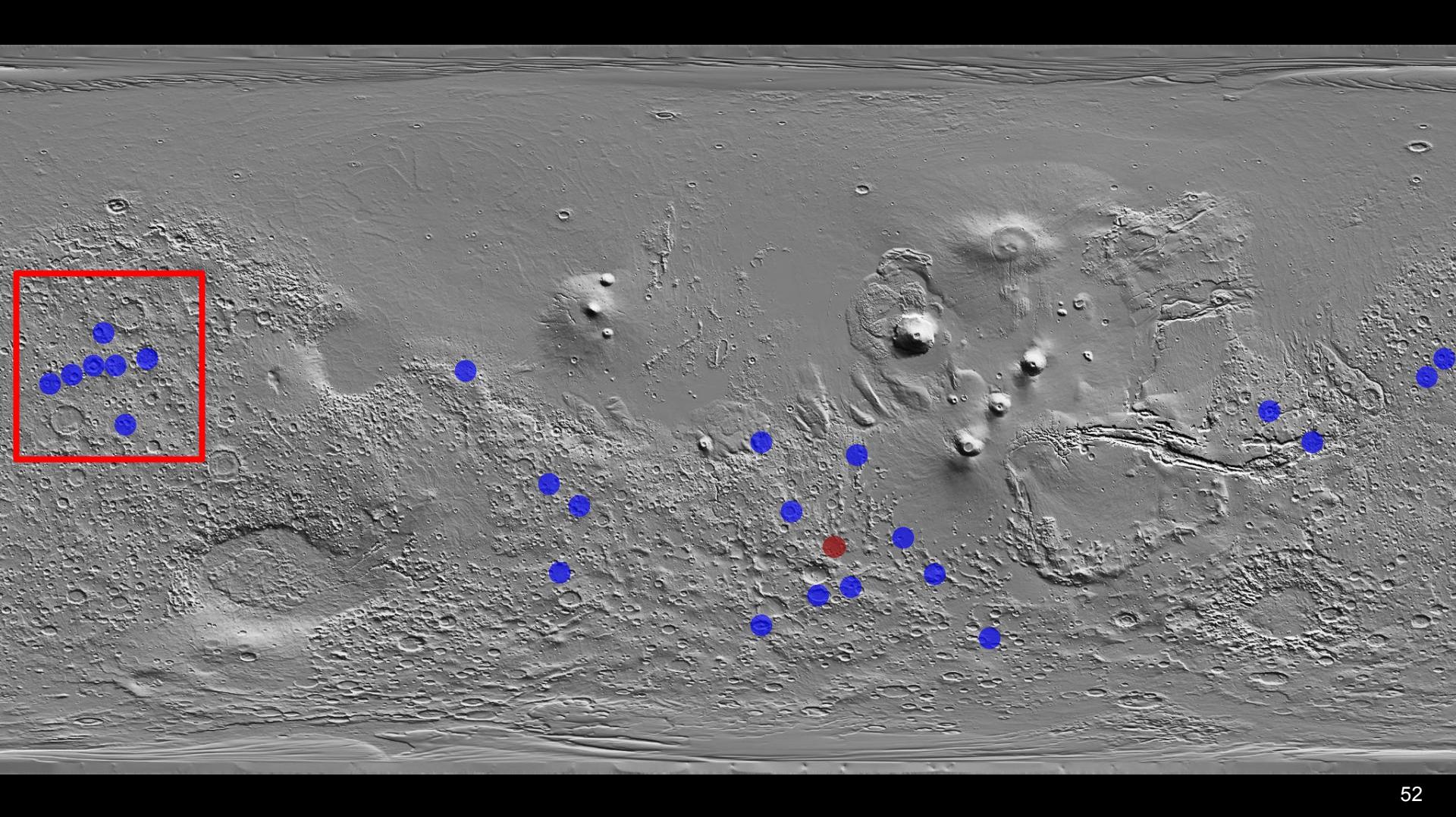


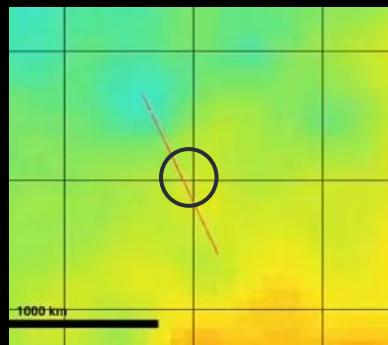
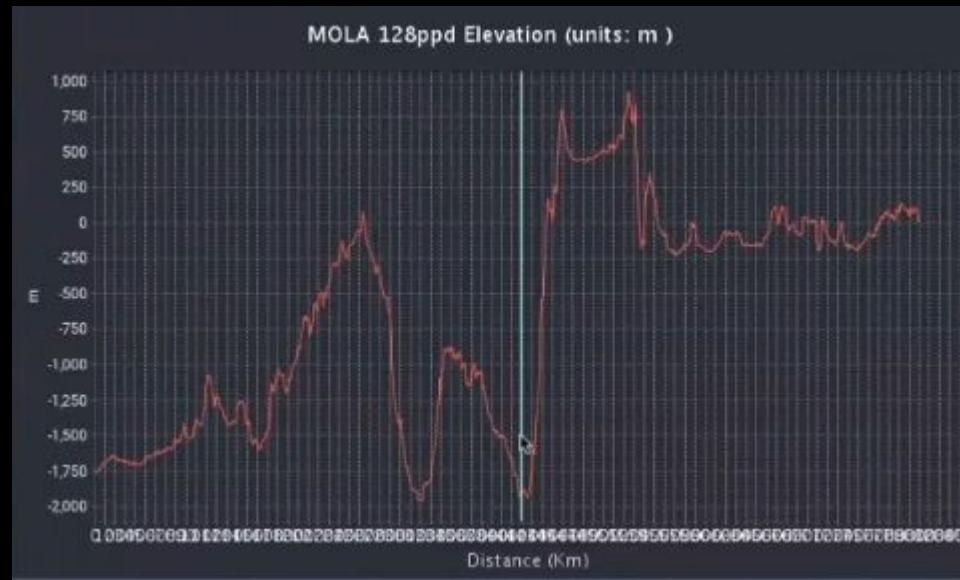


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ET Panache



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