

## SPACE BRAIDING

Braided Communications Ltd invented a new communication tool called Space Braiding to solve the challenge of communication latency in deep space.

It is designed to enable crew on future missions to stay connected with family, friends and colleagues on the ground.

Space Braiding has now been tested in studies funded by the UK Space Agency, the European Space Agency and NASA.<sup>(1)</sup>

## FULL RESEARCH SUITE

Studies of Space Braiding need a control condition. We built two, time delayed messaging and time delayed voice.

If you have a plan to study high latency communications and would like to license Space Braiding and/or the time delayed voice and messaging tools please get in contact.

Find out more at:  
<https://braided.space>

Contact us at:  
[team@braided.space](mailto:team@braided.space)

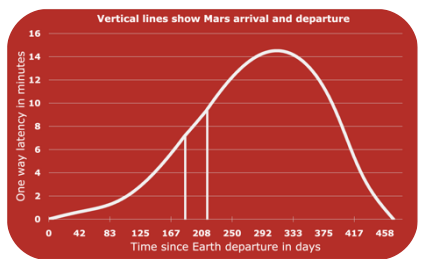
July 2023

## Latency is unavoidable in deep space

Beyond Low Earth Orbit all communication between crew and ground is affected by time delay, caused by the great distance and the finite speed of light and radio waves.

The delay is unavoidable. It applies to all communication throughout all future deep space (lunar and beyond) missions.

For future missions to Mars the



delay will be measured in minutes, not seconds and the change over time will create further challenges (see graph).

## Impacts of latency

Latency is expected to have significant impacts on future missions. Operationally time delay will impact on effective communication between crew and ground.<sup>(2)</sup>

The impact on crew health may be even more significant as, without mitigation, crew will be emotionally isolated

from their loved ones on Earth which is likely to have significant psychological and physiological impacts.

Prolonged isolation is associated with increased inflammation and this in turn will reduce the body's ability to tolerate other stressors such as radiation and microgravity.

## Space Braiding - latency mitigation



Space Braiding is the first tool designed to mitigate the impact of latency.

It does this by structuring written dialogue in a novel way. The discussion is configured in

multiple threads or 'braids' which are presented on a rotating carousel. Each person engages with the braids in sequence but at any point in time each person is engaging with a different active braid on opposite sides of the carousel.

The carousel rotates at a cadence such that users do not confront the latency but instead receive and respond to fresh content from the other person.

(1) Fischer, U et al (2023). Braiding – A novel approach to supporting space/ground communication under signal latency.

(2) Fischer, U. & Mosier, K. (2014). The impact of communication delay and medium on team performance and communication in distributed teams.