

# Complex Systems in Motion: A Summer School on Fluid and Collective Dynamics

2025/2026 NMU–TheCS Forum Summer Study and Research Programme

Hosted by the Theoretical and Computational Sciences Forum

in collaboration with the NMU NITheCS Branch

## ABOUT THE PROGRAMME

Theoretical and Computational Sciences Forum in the Faculty of Science is currently a placeholder for the future envisaged Mandela Institute for Theoretical and Computational Sciences (MITheCS). It aims to foster research, learning, and collaboration in theoretical and computational sciences. The **2025/2026 Summer Study and Research Programme application** is **open** to all final year BSc, BSc(Hons), and students in their first year of MSc or PhD in the fields of mathematical sciences, biological sciences, physical sciences, social sciences, engineering and computational sciences, who want to learn more about the fundamentals of fluid dynamics or its applications. The focus will be on theoretical and computational aspects of fluid dynamics and how it is applied to various disciplines. Participants will also improve their soft skills such as programming, application of numerical or simulation software and report writing.

## ACTIVITIES

- Students will participate in topical lectures including calculations, computing, and literature review.
- Students are expected to collaborate on research projects and present their preliminary findings by the end of the four-week summer study programme.
- To obtain certificates of attendance, students are expected to complete and submit an individual or group report by the end of March 2026.
- Selected projects will be presented at various conferences.

## HOW TO APPLY

The Summer Study and Research Programme will support all **selected** students. However, as funding is **limited**, interested candidates are encouraged to complete the online application no later than **14 November 2025**.

### Required application documents:

- Copy of passport or national ID,
- Proof of student registration at home institution,
- Curriculum Vitae (CV),
- A motivational letter outlining the reason why you should be selected for this particular school,
- University transcripts,
- One signed reference letter from the supervisor is needed.

All documents must be combined and submitted into a single PDF file to: [theecs\\_forum@mandela.ac.za](mailto:theecs_forum@mandela.ac.za).

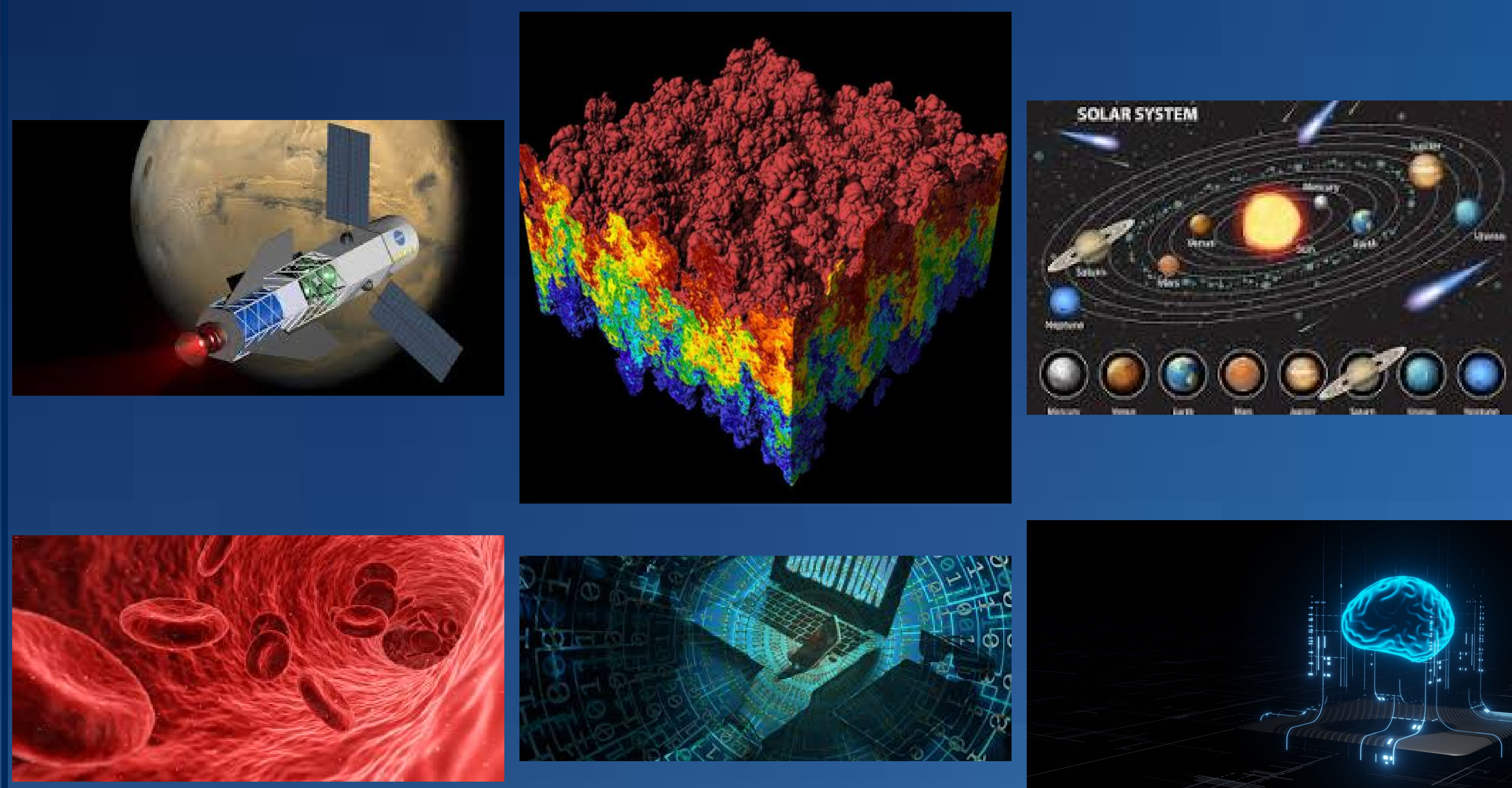
### Funding and Support:

- TheCS Forum will provide all meals during the duration of the programme.
- Students are encouraged to seek funding from their supervisors and their institutions.
- We have also reserved a number of rooms at the affordable institutional rate. Students who want to attend will need to pay ZAR 375 per day for their accommodation during the summer programme.

**Note:** Students must apply in writing to one of the members of the facilitating team to cover their accommodation.

## SUMMER STUDY TOPICS

- **Fundamentals of Fluid Dynamics:** Chaos Theory.
- **Techniques and Methods:** Mathematical foundations, numerical techniques, programming, and simulation.
- **Applications:** Physical systems including: Earth and Climate studies, Chemical processes, Aerodynamics, and Flow systems, Nuclear and Astrophysics Processes: Plasma Physics, Biological processes which include biological and medical sciences.



## IMPORTANT DATES

- Application deadline: **14 November 2025 @ 15:00 (SAST)**.
- Notification of acceptance: **17 November 2025**.
- Summer Study and Research Programme: **23 November – 19 December 2025**.

## FACILITATING TEAM

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|---------------|---------------|
| • B. Kilongo  | • F. Nyaweni  |
| • M. Makhuvha | • O. Ogunlaja |
| • J. Maritz   | • M. Seabi    |
| • C. Moyo     | • M. Weigt    |
| • M. Mutia    |               |

## Apply Online

