



# KePASSA 2026 Technical Program

27–29 May 2026

University of Toulon, Toulon, France

Local organising committee:

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## Acknowledgements

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Centre de Physique Théorique (CPT), Université de Toulon (UTLN), CNRS, Aix-Marseille  
University (amU), FRUMAM, University of La Rioja.





**Venue:** Porte d'Italie Campus – Toulon UFR Faculty of Law, 35 avenue Alphonse Daudet, 83000 Toulon

**Keynote talks:** 60 minutes (including Q&A)

**Regular talks:** 20 minutes (including Q&A)

**Deprit session talks:** 25 minutes (including Q&A)

## Wednesday, 27 May

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**09:00–09:30** Registration and badge pickup

**09:30–10:00** Opening remarks

**10:00–10:30** Coffee break

### Keynote

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10:30–11:30 **Rafael Vázquez**

Taylor map diffusion: closed-form non-Gaussian uncertainty propagation for stochastic orbital dynamics

### Session 1A (11:30–12:30)

#### Propagation and model performance

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1. Hans Carillo — *Data-driven residual corrections for long-term SGP4 propagation in the Galileo region*
2. Omar Elzeiny — *Towards atmosphere model parameter tuning for improved LEO propagation: the example of NRLMSISE-00 and the Swarm-A mission*
3. Eliot Stein — *Decametric-level orbit prediction of MEO/GEO non-cooperative objects using estimated SRP parameters from precise angular measurements*

**12:30–14:00** Lunch

### Session 1B (14:00–15:20)

#### Propagation and model performance

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1. Emilio Rubio-Sánchez — *Fast high-fidelity lunar orbit propagation using generalized equinoctial elements*
2. Alexey Golikov — *Efficient THEONA-based tools for working with TLE in SSA problems*
3. Sergio Cuevas del Valle — *Generalized Hopf-Kustaanheimo-Stiefel transformation for high-performance orbital propagation*
4. Carlos Rubio — *Parallel numerical propagation of attitude with waveform relaxation*

**15:20–15:40** Coffee break

### Session 2 (15:40–18:10)

#### Resonances, chaos, and multi-body transport

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1. Cassandra Barbis — *Numerical investigation of effective stability and chaos in the J2-Solar radiation pressure problem*

2. Roberto Flores — *A complete position-time map of chaotic behavior in uncontrolled geostationary satellites*
3. Aaron Rosengren — *The cislunar and translunar chaotic clearing zones of first-order resonance overlap*
4. Mathilda Bolis — *Unstable manifold structures applied to cislunar disposal design in the coupled circular restricted three-body problem*

**Break (10 minutes)**

5. Anjali Rawat — *Phase-space structure of the translunar 1:2 mean-motion resonance*
6. Bhanu Kumar — *Analysis of unstable resonant orbits for Saturn tour design: between Titan and Rhea*
7. Jonathan Or-Hof — *Transient collision trajectories in the Mars-Deimos system*

**Thursday, 28 May**

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**Session 3 (09:00–11:00)**

**Analytical and semi-analytical methods**

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1. Martin Lara — *Making the critical inclination of artificial satellite theory non-critical*
2. Jose Montilla — *Direct residue decomposition for automated zonal perturbation theory*
3. Ana S. Rivero — *A simple analytical solution for the long-term dynamics of the mean eccentricity vector in the lunar gravitational field*
4. Ryan Menges — *Semi-analytical state transition tensor propagation in the circular restricted three-body problem*
5. Daniel Scheeres — *The structure of local motion: unpacking the state transition matrix*
6. Luke Peterson — *Local orbital elements around periodic orbits*

**11:00–11:20** Coffee break

**Session 4 (11:20–12:40)**

**Space Debris, fragmentation, and collision risk**

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1. Juan Felipe Cabrera — *Fragmentation cloud modelling for collision risk estimation in LEO*
2. Miguel Rodriguez Poza — *Analytical modelling of marginal distributions for fragmentation events*
3. José J. Rosales — *Collision avoidance in cislunar space: a review of multi-body dynamics, uncertainty propagation, and service architecture*
4. Manuel Sanjuro-Rivo — *Ideal frame formulation for efficient propagation in collision assessment scenarios*

**12:40–14:00** Lunch

## Special session: André Deprit

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- 14:00–14:25 Introduction & KePASSA history  
14:25–14:50 Gilles Métris — Deprit’s averaging algorithm in the frame of semi-analytical theories developed at Observatoire Côte d’Azur  
14:50–15:15 Gabriella Pinzari — *Deprit’s nodes reduction for planetary systems*  
15:15–15:40 Alberto Escapa — Attitude dynamics, the rotation of the Earth, and Hori-Deprit perturbation methods  
15:40–16:05 Sebastian Ferrer — *A decade with André Deprit: Snapshots for a Biography*  
**16:05–16:30** Coffee break  
16:30–16:55 Giulio Baù — Slowly moving frames for perturbed Keplerian motions  
16:55–17:20 Yuying Liang — *Revisiting Deprit’s legacy in triangular libration points*  
17:20–17:45 Juan-Félix San-Juan — *Elimination of the parallax: a simplification for solving the zonal problem in artificial satellite theory to any order*  
17:45–18:10 Martin Lara — *Deprit’s integrability conjecture in the setting of Vinti’s dynamical model*

**Gala dinner**

## Friday, 29 May

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### Keynote

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- 10:00–11:00 **Francesco Toppo**  
Trajectory design for asteroid missions: the case of Hera’s Milani and RAMSES’ Farinella

### Session 5 (11:00–12:40)

#### Uncertainty and estimation

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1. Jan Grabowski — *Linear covariance propagation and synchronisation in time-stabilised dynamics*
2. Antonio Malaver — *A heteroskedasticity and autocorrelation consistent methodology for process noise calibration in multi-sensor sequential orbit determination*
3. Ego Kaygorodov — *Bayesian identification of control laws from noisy ephemerides applied to GEO stationkeeping manoeuvres*
4. Benjamin L. Hanson — *On the efficacy of linear uncertainty propagation for low-probability asteroid impacts*
5. Alexis Petit — *Heterogeneous sensor networks for space object cataloguing: strategies and performance assessment*

**12:40–13:00** Closing and farewell

**13:00** Lunch

**Social activities**