

# New control point networks for the Galilean satellites

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## Abstract

We have derived a new Ganymede 3D control point network and studied the satellite's global shape using combinations of more than 200 Galileo and Voyager images. In a previous analysis [1], only 2D coordinates for approximately 2100 control points and a mean radius were determined; Ganymede was assumed to be in tidal equilibrium shape and orientation. Benefitting from improved spacecraft trajectory data and a much larger set of new measured 3000 control points, we determine 3D-control point coordinates and can measure global shape parameters directly. From our measurements, we confirm that Ganymede's shape is approximated by an ellipsoid, with its long axis near the Jupiter line. Our data agree with Ganymede being in tidal equilibrium shape [1] and topography measured from limb coordinates [2]. Owing to the large errors of our control point heights, we cannot confidently identify any topography at scales smaller than the ellipsoidal model. Our results will form a basis for geometrically accurate maps, useful for planning and operation of ESA's JUICE mission. While we have almost concluded our work on Ganymede, we plan to produce new 3D control point networks for Europa and Calisto by the end of this year.

## References

- [1] Davies M. E., et al. (1998), The Control Networks of the Galilean Satellites and Implications for Global Shape, *Icarus* 135, 372–376, Article No. IS985982.
- [2] Thomas, P. C., D. Simonelli, J. Burns, M.E. Davies, A.S. McEwen, M. Belton, Galileo SSI Team, Shapes and topography of Galilean satellites from Galileo SSI limb coordinates, Conference Paper, 28th Annual Lunar and Planetary Science Conference, p. 429, 1997.

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