

Supplementary Information

Evidence for multi-fragmentation and mass shedding of boulders on rubble-pile binary asteroid system (65803) Didymos

M. Pajola^{1,*}, F. Tusberti¹, A. Lucchetti¹, O. Barnouin², S. Cambioni³, C.M. Ernst², E. Dotto⁴, R.T. Daly², G. Poggiali^{5,6}, M. Hirabayashi⁷, R. Nakano^{7,8}, E. Mazzotta Epifani⁴, N.L. Chabot², V. Della Corte⁹, A. Rivkin², H. Agrusa^{10,11}, Y. Zhang¹², L. Penasa¹, R.-L. Ballouz², S. Ivanovski¹³, N. Murdoch¹⁴, A. Rossi¹⁵, C. Robin¹⁴, S. Ieva⁴, J.B. Vincent¹⁶, F. Ferrari¹⁷, S.D. Raducan¹⁸, A. Campo-Bagatin¹⁹, L. Parro^{19,20}, P. Benavidez¹⁹, G. Tancredi²¹, Ö. Karatekin²², J.M. Trigo-Rodriguez²³, J. Sunshine¹⁰, T. Farnham¹⁰, E. Asphaug²⁴, J.D.P. Deshapriya⁴, P.H.A. Hasselmann⁴, J. Beccarelli¹, S.R. Schwartz²⁴, P. Abell²⁵, P. Michel^{11,26}, A. Cheng², J.R. Brucato⁵, A. Zinzi^{27,28}, M. Amoroso²⁷, S. Pirrotta²⁷, G. Impresario²⁷, I. Bertini²⁹, A. Capannolo¹⁴, S. Caporali⁵, M. Ceresoli¹⁷, G. Cremonese¹, M. Dall’Ora⁹, I. Gai³⁰, L. Gomez Casajus³⁰, E. Gramigna³⁰, R. Lasagni Manghi³⁰, M. Lavagna¹⁷, M. Lombardo³⁰, D. Modenini³⁰, P. Palumbo³¹, D. Perna⁴, P. Tortora³⁰, M. Zannoni³⁰, G. Zanotti¹⁷.

¹INAF-Astronomical Observatory of Padova, Vic. Osservatorio 5, 35122 Padova, Italy
(*Corresponding author: maurizio.pajola@inaf.it);

²Johns Hopkins University Applied Physics Laboratory, Laurel, MD 20723, USA;

³Dept. of Earth, Atmospheric and Planetary Sciences, Massachusetts Institute of Technology, Cambridge, MA-USA;

⁴INAF-Osservatorio Astronomico di Roma, Monte Porzio Catone, Roma, Italy;

⁵INAF-Osservatorio Astrofisico di Arcetri, Firenze, Italy;

⁶LESIA-Observatoire de Paris PSL, Paris, France;

⁷Georgia Institute of Technology, Atlanta, GA 30332, USA;

⁸Department of Aerospace Engineering, Auburn University, AL 36849, USA;

⁹INAF-Osservatorio Astronomico di Capodimonte, Napoli, Italy;

¹⁰University of Maryland, Department of Astronomy, MD-USA;

¹¹Université Côte d’Azur, Observatoire de la Côte d’Azur, CNRS, Laboratoire Lagrange, Nice, France;

¹²Climate & Space Sciences and Engineering, University of Michigan, MI-USA;

¹³INAF-Osservatorio Astronomico di Trieste, Trieste, Italy;

¹⁴Institut Supérieur de l’Aéronautique et de l’Espace (ISAE-SUPAERO), Université de Toulouse, France;

¹⁵IFAC-CNR, Sesto Fiorentino, Firenze, Italy;

¹⁶DLR Berlin, Germany;

¹⁷Politecnico di Milano - Bovisa Campus, Dipartimento di Scienze e Tecnologie Aeroespaziali, Milano, Italy;

¹⁸Space Research and Planetary Sciences, Physikalisches Institut, University of Bern, Bern, Switzerland;

¹⁹Universidad de Alicante, Spain;

²⁰University of Arizona, AZ-USA;

²¹Dpto. Astronomia, Facultad Ciencias Igua 4225, Montevideo, Uruguay;

²²Royal Observatory of Belgium, Belgium;

²³Institute of Space Sciences (ICE, CSIC) and Institut d’Estudis Espacials de Catalunya (IEEC), Spain;

²⁴Planetary Science Institute; University of Arizona, AZ-USA;

²⁵NASA Johnson Space Center, Houston, TX-USA;

²⁶The University of Tokyo, Department of Systems Innovation, School of Engineering, Tokyo, Japan;

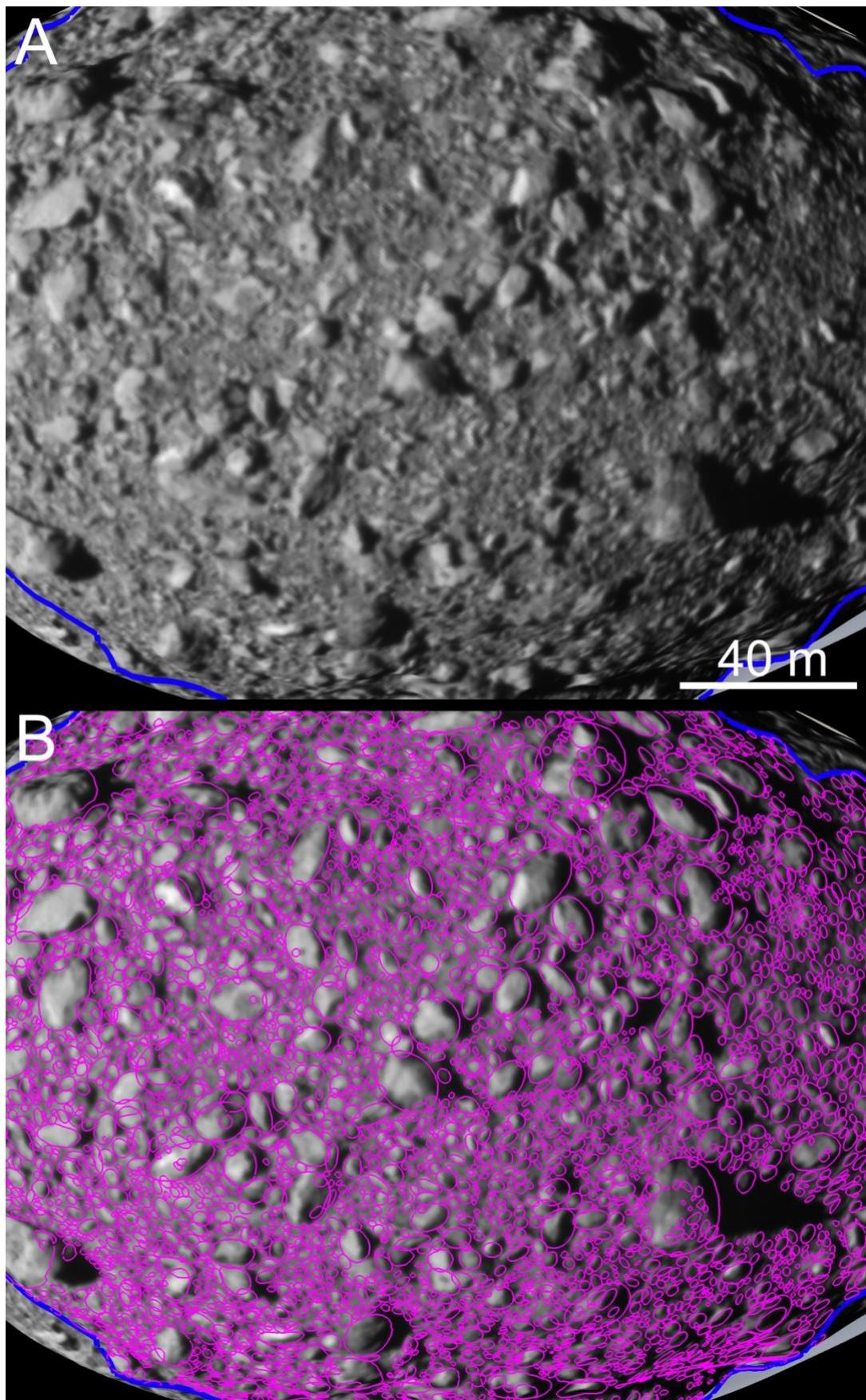
²⁷Agenzia Spaziale Italiana, Roma, Italy;

²⁸Space Science Data Center – ASI, Roma Italy;

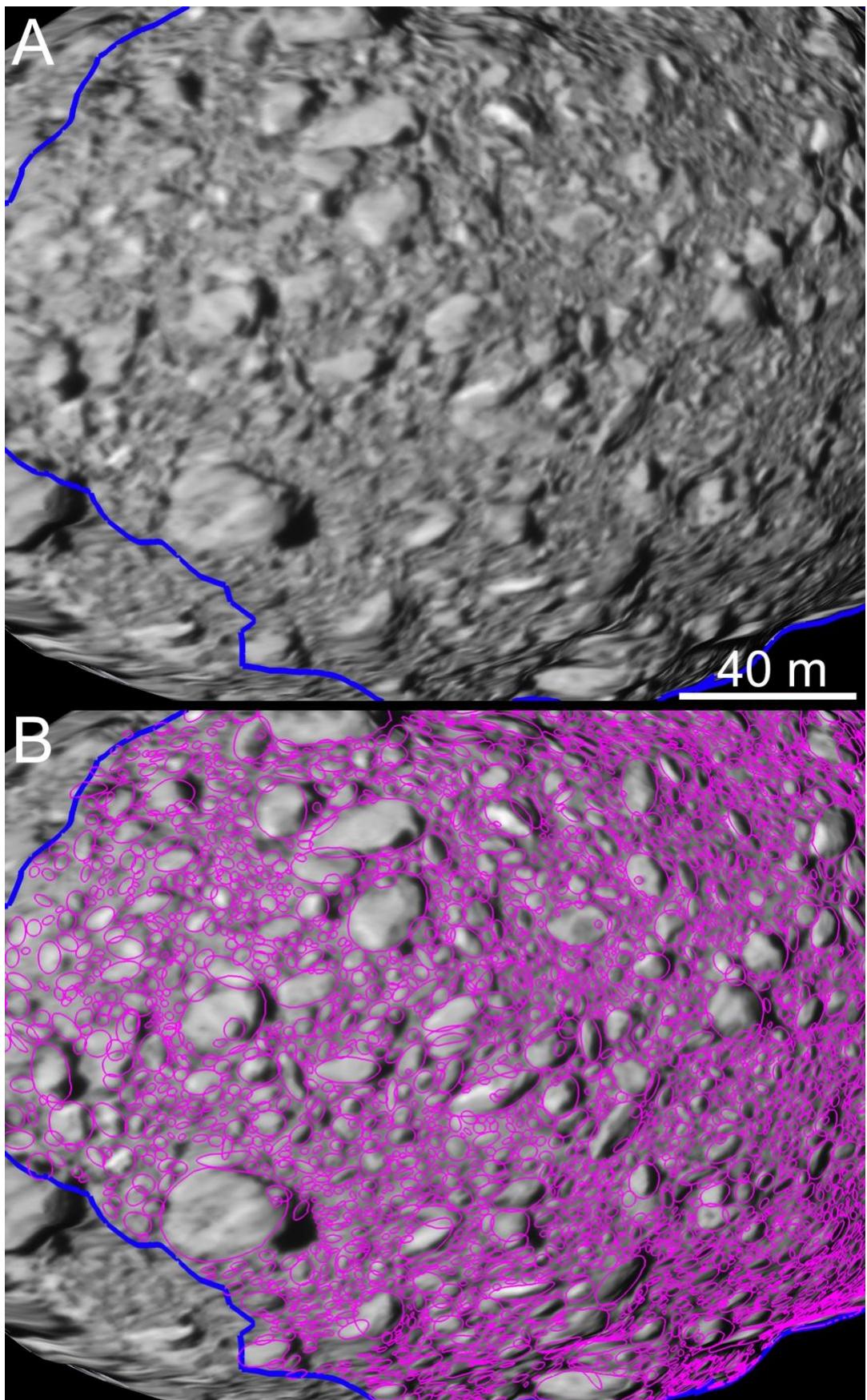
²⁹Università degli Studi di Napoli “Parthenope”, Dipartimento di Scienze & Tecnologie, Centro Direzionale, Napoli, Italy;

³⁰Alma Mater Studiorum - Università di Bologna, Dipartimento di Ingegneria Industriale, Forlì, Italy; Alma Mater Studiorum - Università di Bologna, Centro Interdipartimentale di Ricerca Industriale Aerospaziale, Forlì, Italy.

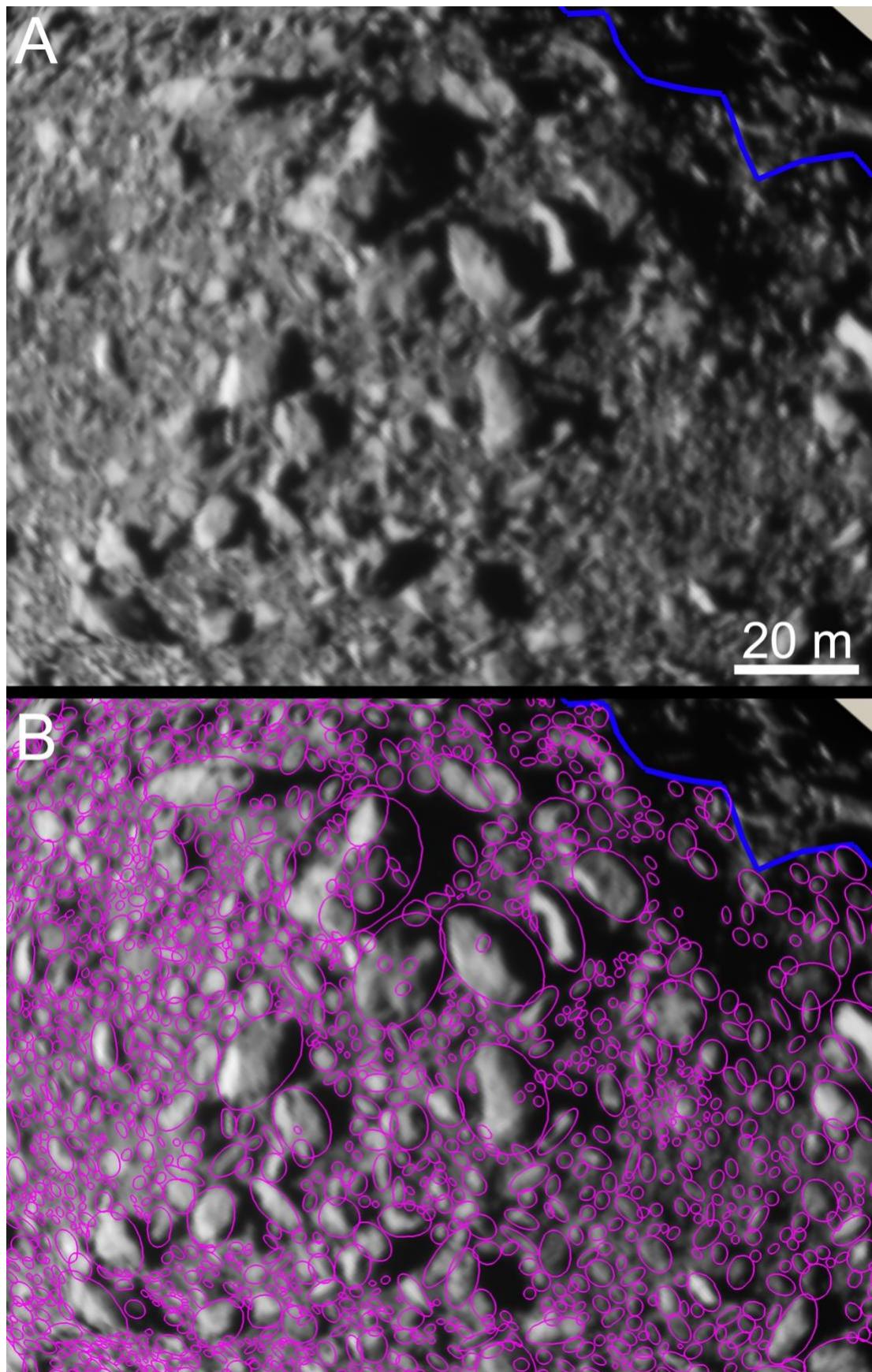
³¹INAF-Istituto di Astrofisica e Planetologia Spaziali, Roma, Italy.



Supplementary Figure 1. Closeup image showing both the uninterpreted boulders (A) and the identified ones, outlined in pink (B). The blue polygon is the study area.



Supplementary Figure 2. Closeup image showing both the uninterpreted boulders (A) and the identified ones, outlined in pink (B). The blue polygon is the study area.



Supplementary Figure 3. Closeup image showing both the uninterpreted boulders (A) and the identified ones, outlined in pink (B). The blue polygon is the study area.