

# Fusion technology

CONTENTS / JULY 2000—VOL. 38, NO. 1

## THIRTEENTH TARGET FABRICATION SPECIALISTS' MEETING

- iii Comments / *George Miley*
- v Guest Editor's Comments / *Ken Schultz*

### TECHNICAL PAPERS

- 1 Alternative Fuels for ICF Targets / *James K. Hoffer*
- 6 Shock Timing and Yield Sensitivity Studies for NIF Ignition Capsules / *R. E. Olson*
- 11 Characteristics of ICF Relevant Hohlräume Driven by X-Rays from a Z-Pinch / *T. W. Sanford, R. E. Olson, R. A. Vesey, G. A. Chandler, D. E. Hebron, R. C. Mock, R. J. Leeper, T. J. Nash, C. L. Ruiz, L. E. Ruggles, W. W. Simpson, R. L. Bowers, W. Matuska, D. L. Peterson, R. R. Peterson*
- 16 Developments in NIF Beryllium Capsule Design / *D. C. Wilson, P. A. Bradley, S. R. Goldman, N. M. Hoffman, R. W. Margevicius, R. B. Stephens, R. E. Olson*
- 22 Status of Target Injection and Tracking Studies for Inertial Fusion Energy / *Ronald W. Petzoldt, Dan Goodin, Nathan Siegel*
- 28 Influence of Residual Gas on the Life of Cryogenic Target and Trajectory of Injected Targets / *T. Norimatsu, A. Sunahara, K. Nagai, T. Yamanaka*
- 34 Cooling-Induced Deformation of Polystyrene Spherical Shells / *T. Endo, K. Shibata, Y. Fujima, T. Norimatsu*
- 42 Large Glass Shells from GDP Shells / *Martin L. Hoppe*
- 46 Decreasing Out-of-Round in Poly ( $\alpha$ -Methylstyrene) Mandrels by Increasing Interfacial Tension / *Masaru Takagi, Robert Cook, Richard Stephens, Jane Gibson, Sally Paguio*
- 50 Stiffening of P $\alpha$ MS Mandrels During Curing / *Masaru Takagi, Robert Cook, Richard Stephens, Jane Gibson, Sally Paguio*
- 54 The Effects of Controlling Osmotic Pressure on a P $\alpha$ MS Microencapsulated Mandrel During Curing / *Masaru Takagi, Robert Cook, Richard Stephens, Jane Gibson, Sally Paguio*
- 58 Fabrication of Thin Walled Glow Discharge Polymer Shells / *Abbas Nikroo, J. M. Pontelandolfo*
- 62 Properties of a-C:H Coatings Prepared by PECVD for Laser Fusion Targets / *M. Theobald, P. Baclet, O. Legaie, J. Durand*
- 69 Progress Update on CVD of Beryllium / *Kenneth Salazar, Stevan G. Pattillo, Mitchell Trkula*

(Continued)

# CONTENTS / JULY 2000—VOL. 38, NO. 1

(Continued)

- 74 Models of Polyimide Spray Coatings / *Robert Cook*
- 83 Mechanical Properties and Gas Permeability of Polyimide Shells Fabricated by the Vapor Deposition Method / *F.-Y. Tsai, E. L. Alfonso, S.-H. Chen, D. R. Harding*
- 90 High Performance Aromatic Polyimides for Inertial Confinement Fusion Experiment: Capsule and Membrane Applications / *Didier Marsacq, Franck Jousse*
- 94 Development of Polyimide Ablators for NIF: Analysis of Defects on Shells, a Novel Smoothing Technique, and Upilex Coatings / *C. Chad Roberts, Pascal J. Orthion, April E. Hassel, Bryan K. Parrish, Steven R. Buckley, Evelyn Fearon, Stephan A. Letts, Robert C. Cook*
- 108 Living Radical Polymerization of Trimethylsilylstyrene / *B. W. McQuillan, S. Paguio*
- 110 Studies in Microcellular Polymer Foams, Produced by Copolymerization / *Wigen Nazarov, Philip G. McGivern*
- 115 Regular Foams, Loaded Foams and Capsule Suspension in the Foam for Hohlräume in ICF / *N. G. Borisenko, A. I. Gromov, Yu. A. Merkul'ev, A. V. Mitrofanov, W. Nazarov*
- 119 Novel Three-Dimensional Microengineering Techniques / *R. P. Keatch, B. Lawrenson, L. M. Huang, A. Meramveliotaki*
- 123 Quantitative Analysis of Backlit Shadowgraphy as a Diagnostic of Hydrogen Ice Surface Quality in ICF Capsules / *J. A. Koch, T. P. Bernat, G. W. Collins, B. A. Hammel, B. J. Kozioziemski, A. J. MacKinnon, J. D. Sater, D. N. Bittner, Y. Lee*
- 132 Seeing Shell Wall Fluctuations / *Richard B. Stephens, Tony Mroczkowski, Jane Gibson*
- 136 Pressure Testing of Micro Balloons by Bursting / *Mike A. Salazar, Pete Gobby, Robert Watt*
- 139 The Production of High-Aspect-Ratio Microstructures (HARMS) / *Robert Keatch, Brian Lawrenson, Mark Finlay, Barrie Lewis, Colin Horsfield*
- 143 The 20K Cryogenic Grip for the Laser MegaJoule Cryo-Targets / *Denis Chatain, Jean Paul Perin, Olivier Chanal, Denis Desenne*
- 149 Temperature Profiles and  $\ell = 1$  Nonuniformity Within Cryogenic ICF Targets / *E. L. Alfonso, I. Anteby, D. R. Harding*
- 156 Cryogenic Indirect Drive Target: A Thermal Study / *Sophie Charton, Arnaud Fabre, Philippe Baclet*
- 161 Laser Targets of Beryllium Deuteride / *N. G. Borisenko, V. M. Dorogotovtsev, A. I. Gromov, S. Yu. Guskov, Yu. A. Merkul'ev, Yu. E. Markushkin, N. A. Chirin, A. K. Shikov, V. F. Petrunin*
- 166 Free-Standing Target Technologies for ICF / *I. V. Aleksandrova, E. R. Koresheva, I. E. Osipov, S. M. Tolokonnikov, L. A. Rivkis, V. P. Veselov, A. A. Belolipetskiy, G. D. Baranov, V. I. Listratov, V. G. Soloviev, I. D. Timofeev, G. S. Usachev, L. S. Yaquzhinskiy*