

REPORT DOCUMENTATION PAGE			Form Approved OMB NO. 0704-0188
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.			
1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE 02-10-1997	3. REPORT TYPE AND DATES COVERED Interim Progress Report: 1 Jan '95 to 31 Dec. '95	
4. TITLE AND SUBTITLE (a) Two phase flows of rheologically-complex fluids & (b) Aerodynamic dissemination		5. FUNDING NUMBERS (a) DA/DAAH04-95-1-0106 and (b) DA/DAAH04-94-G-0266	
6. AUTHOR(S) Daniel D. Joseph			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Department of Aerospace Engineering and Mechanics University of Minnesota Minneapolis, MN 55455		8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) U.S. Army Research Office P.O. Box 12211 Research Triangle Park, NC 27709-2211		10. SPONSORING / MONITORING AGENCY REPORT NUMBER 33147 - MA	
11. SUPPLEMENTARY NOTES The views, opinions and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other documentation.			
12 a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution unlimited.		12 b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) The projects on two-phase flows are on the direct simulation of the motion of particles in viscoelastic fluids. The second project is to study the problem of diffusion and fluid mechanics of binary mixtures of incompressible miscible liquids; when the density difference of the mixing liquids is taken into account the velocity field is not solenoidal and theory is not classical. The third problem is to study drop breakup of thickened liquids at high Mach numbers. We received additional funding for "Aerodynamic Dissemination" to build and instrument a Mach 8 shock tube to visualize and analyze the breakup of drops. This shock tube was built and partly instrumented and interim results are reported here.			
14. SUBJECT TERMS		15. NUMBER OF PAGES	
		16. PRICE CODE	
17. SECURITY CLASSIFICATION OR REPORT UNCLASSIFIED	18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASSIFIED	19. SECURITY CLASSIFICATION OF THIS ABSTRACT UNCLASSIFIED	20. LIMITATION OF ABSTRACT UL

REPORT DOCUMENTATION PAGE			Form Approved OMB NO. 0704-0188	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.				
1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE February, 1997	3. REPORT TYPE AND DATES COVERED Interim Progress Report: 1 Jan '96 to 31 Dec. '96		
4. TITLE AND SUBTITLE Two-Phase Flows of Rheologically - Complex Fluids		5. FUNDING NUMBERS DAAH04-95-1-0106		
6. AUTHOR(S) Daniel D. Joseph				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Department of Aerospace Engineering and Mechanics University of Minnesota Minneapolis, MN 55455		8. PERFORMING ORGANIZATION REPORT NUMBER		
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) U.S. Army Research Office P.O. Box 12211 Research Triangle Park, NC 27709-2211		10. SPONSORING / MONITORING AGENCY REPORT NUMBER		
11. SUPPLEMENTARY NOTES The views, opinions and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other documentation.				
12 a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution unlimited.		12 b. DISTRIBUTION CODE		
13. ABSTRACT (Maximum 200 words) The projects on two-phase flows are on the direct simulation of the motion of particles in viscoelastic fluids. The second project is to study the problem of diffusion and fluid mechanics of binary mixtures of incompressible miscible liquids; when the density difference of the mixing liquids is taken into account the velocity field is not solenoidal and theory is not classical. The third problem is to study drop breakup of thickened liquids at high Mach numbers. We received additional funding for "Aerodynamic Dissemination" to build and instrument a Mach 8 shock tube to visualize and analyze the breakup of drops. This shock tube was built and partly instrumented and interim results are reported here.				
14. SUBJECT TERMS		15. NUMBER OF PAGES		
		16. PRICE CODE		
17. SECURITY CLASSIFICATION OR REPORT UNCLASSIFIED	18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASSIFIED	19. SECURITY CLASSIFICATION OF THIS ABSTRACT UNCLASSIFIED	20. LIMITATION OF ABSTRACT UL	