

## CONTENTS

FOREWORD . . . . .	v
INTRODUCTION . . . . .	xi
SESSION I - INTRODUCTION; DENSITY MEASUREMENTS	
SESSION CHAIRMAN, W. H. Heiser	
Laser Raman Scattering Applications	
R. Goulard . . . . .	3
Analysis of Raman Contours in Vibration-Rotation Spectra	
R. Gaufres . . . . .	15
Measurement of Aircraft Turbine Engine Exhaust Emissions	
Donald A. Leonard . . . . .	45
The Use of a Fabry-Perot Interferometer for Studying	
Rotational Raman Spectra of Gases	
J. J. Barrett . . . . .	63
Gas Concentration Measurement by Coherent Raman	
Anti-Stokes Scattering	
P. R. Régnier and J.-P. E. Taran . . . . .	87
SESSION II - TEMPERATURE MEASUREMENTS; CHEMISTRY	
SESSION CHAIRMAN, A. B. Harvey	
Flame Temperatures from Vibrational Raman Scattering	
Marshall Lapp . . . . .	107
Measurement of Vibrational and Rotational-Translational	
Temperatures Independently from Pure Rotational Raman Spectra	
A. B. Harvey . . . . .	147
Raman Scattering and Fluorescence Studies of Flames	
P. J. Hendra, C. J. Vear, R. Moss, and J.J. Macfarlane . . . . .	153

Measurement of Rotational Temperatures by Raman Spectroscopy: Application of Raman Spectroscopy to the Acquisition of Thermodynamic Values in a Chemical System A. S. Gilbert and H. J. Bernstein . . . . .	161
Transient Flow Field Temperature Profile Measurement Using Rotational Raman Spectroscopy J. R. Smith . . . . .	171
Low Temperature Measurements by Rotational Raman Scattering Jack A. Salzman . . . . .	179
SESSION III - RESONANCE EFFECTS; REMOTE PROBES; EXPERIMENTAL ADVANCES SESSION CHAIRMAN, W. Kiefer	
Light-Scattering and Fluorescence in the Approach to Resonance - Stronger Probing Processes C. M. Penney . . . . .	191
Observation of S-Band Heads in the Resonance Raman Spectrum of Iodine Vapor W. Kiefer . . . . .	219
Remote Raman Scattering Probes S. H. Melfi . . . . .	231
Rapid and Ultra Rapid Raman Spectroscopy Michel Bridoux, André Chapput, Michel Delhaye, Harvé Tourbez and Francis Wallart . . . . .	249
Electronic Signal Processing for Raman Scattering Measurements E. Robert Schildkraut . . . . .	259
SESSION IV - TECHNOLOGY APPLICATIONS SESSION CHAIRMAN, D. Bershader	
Introductory Remarks for Session on Technological Applications of Raman Scattering, with Emphasis on Fluid Mechanics and Combustion D. Bershader . . . . .	281
Laser Raman Scattering - A Technique for Arc-Tunnel Flow Calibration A. A. Bojarski and Fred L. Daum . . . . .	285
Results of Recent Applications of Raman Scattering to Research Problems at NASA Langley Research Center W. W. Hunter, Jr. . . . .	299

CONTENTS

Raman Scattering Measurements of Mean Values and  
Fluctuations in Fluid Mechanics  
Samuel Lederman . . . . . 303

Raman Gas Mixing Measurements and Ramanography  
Danny L. Hartley . . . . . 311

Raman Scattering with High Gain Multiple-Pass Cells  
R. A. Hill and D. L. Hartley . . . . . 315

Preliminary Results of Raman Scattering Diagnostics  
of Expansion Flows  
J. W. L. Lewis . . . . . 331

Study of Reactions Producing Vibrationally-Excited  
Nitrogen  
Graham Black . . . . . 335

Application of Raman Scattering to Gasdynamic Flows  
J. W. Daiber . . . . . 337

Remote Raman Temperature Measurement with a Dye Laser  
M. E. Mack . . . . . 353

Raman Spectroscopy of Some Hydrocarbons and Freons in  
the Gas Phase  
David A. Stephenson . . . . . 361

The Possible Application of Raman Scattering  
Measurements to Turbulent Mixing Layers  
E. Storm . . . . . 369

Fourier Transform Raman Spectroscopy  
E. Robert Schildkraut and Tomas B. Hirschfeld . . . . . 379

LIST OF ATTENDEES . . . . . 389

AUTHOR INDEX . . . . . 393

SUBJECT INDEX . . . . . 395