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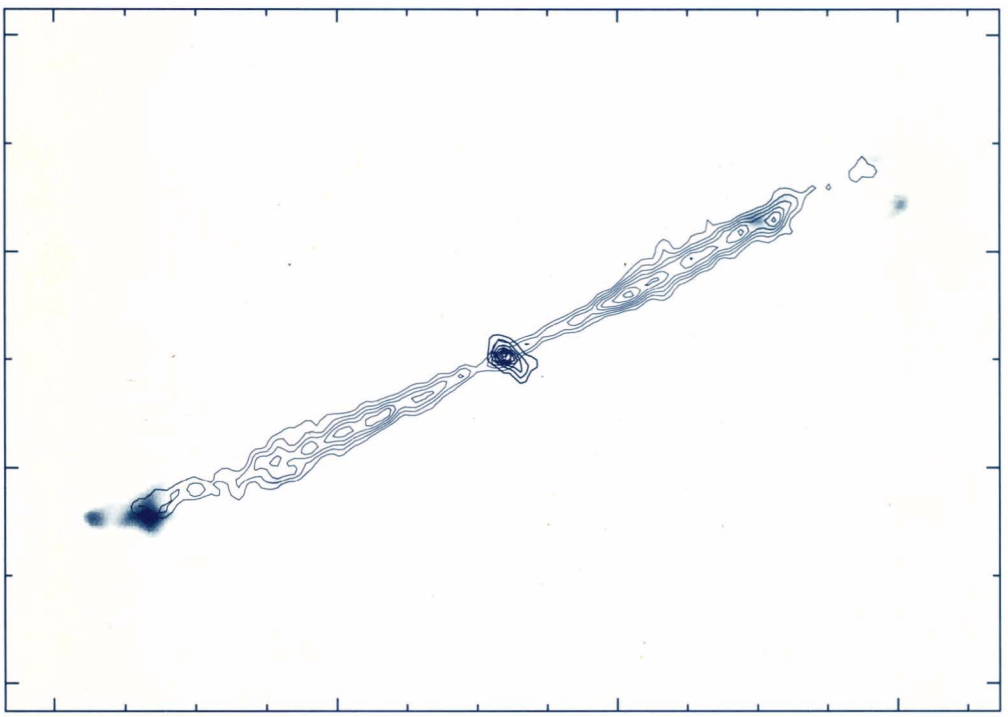
HERBIG–HARO FLOWS AND THE BIRTH OF LOW MASS STARS

Edited by BO REIPURTH AND CLAUDE BERTOUT



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EDITED BY

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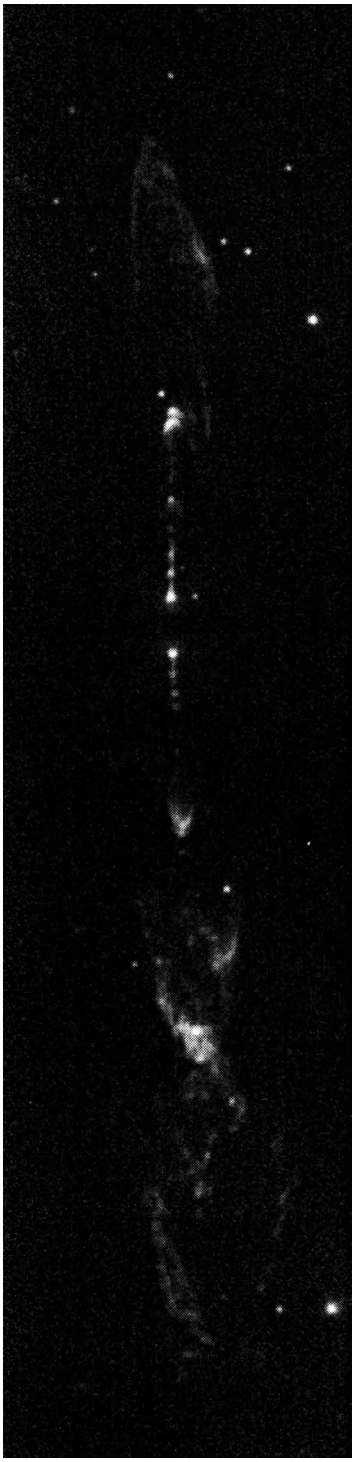

HH 212

This molecular hydrogen image (v=1–0 S(1) line at 2.122 μm) shows the highly symmetric jet HH 212 in Orion, which emanates from a deeply embedded young source, IRAS 05413−0104, and drives an associated molecular outflow. The symmetric and periodic nature of the inner knots and outer bow shocks point to fluctuations at the source as their origin. The image covers 0.15×0.61 parsec at a distance of 450 pc, and has been rotated to place the jet vertically; its true position angle is 24 degrees E of N. Further details can be found in the paper by Zinnecker *et al.* in the poster proceedings of this meeting.

Data taken by Mark McCaughrean using MAGIC on the Calar Alto 3.5-m; 0.7 arcsec seeing; 14 minutes integration time; 1.1×4.6 arcmin field; continuum not subtracted.

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TABLE OF CONTENTS

I. HERBIG-HARO OBJECTS, H_2 FLOWS AND RADIO JETS

50 Years of Herbig-Haro Research

B. Reipurth & S. Heathcote

1. The Discovery of HH Objects 3
2. The Early Years 5
3. Shock Physics, Kinematics and Multi-Wavelength Data 6
4. The HH 111 Jet 9
5. The HH 47 Jet 14

HST Observations of the L1551 IRS5 Jet

C.V.M. Fridlund, M. Huldtgren & R. Liseau

1. Introduction & Background 19
2. HST Observations 22
3. Results 23
4. Conclusions 27

Giant Herbig-Haro Flows

J. Bally & D. Devine

1. Introduction 29
2. Observed Properties 33
3. Consequences of Parsec-Scale Herbig-Haro Flows 35

Herbig-Haro Objects in the Orion Nebula Region

C.R. O'Dell

1. Introduction 39
2. Structure of the Orion Nebula Region 41
3. The Two HH Object Systems in this Region 41
   3.1 The North System 42
   3.2 The South System 44
4. Discussion 45

https://doi.org/10.1017/S0074180900061994 Published online by Cambridge University Press

Spectroscopic Properties of Herbig-Haro Flows

K.-H. Böhm & A.P. Goodson

1. Introduction 47
2. Some Unsolved Problems of Herbig-Haro Spectra 49
3. The Reliability of Quantitative Spectrophotometry in HH Objects and the Gas-Phase Abundances of Metals 56
4. Attempts to Explain UV and the 2μm IR Spectra of H_2 57
5. The Explanation of Line Profiles and Position-Velocity Diagrams 58
6. Future Studies of HH Spectra 60

Spectroscopic Signatures of Microjets

J. Solf

1. Introduction 63
2. Observations and Data Reduction Techniques 64
3. Results and Discussion 65
   - 3.1 Spectroscopic Signatures of Microjets 65
   - 3.2 The Case of DG Tau 67
     - 3.2.1 General Remarks 67
     - 3.2.2 Time Variability 69
     - 3.2.3 The High-Velocity Gas Component (HVC) 69
     - 3.2.4 The Low-Velocity Gas Component (LVC) 71
     - 3.2.5 The Near-Rest-Velocity Gas Component (NRVC) 72

The Ionization State along the Beam of Herbig-Haro Jets

F. Bacciotti

1. Introduction 73
2. The Diagnostic Procedure 74
3. First Inspection of the HH 34 and HH 111 Jets 75
4. Analyses from Long-Slit Spectra 76
5. Conclusions 80

Thermal Radio Jets

L.F. Rodríguez

1. Introduction 83
2. Thermal Jets 84
   - 2.1 How are Thermal Radio Jets Identified? 84
   - 2.2 Advantages and Disadvantages 86
   - 2.3 Are Thermal Jets Always Present in Outflow Regions? 88
3. Quadrupolar Outflows 88
   - 3.1 L723 89
   - 3.2 HH 111 89

Molecular Hydrogen Emission in Embedded Flows

J. Eislöffel

1. Introduction 93
2. Morphology of H_2 in Outflows 94
3. Excitation of H_2 in Outflows 95
4. Kinematics of H_2 in Outflows 97

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5. Comparison of H_2 and CO Outflows 99
6. Entrainment Mechanisms 100
7. Conclusions 101

Turbulent Mixing Layers in Herbig-Haro and Embedded H_2 Jets

A. Noriega-Crespo

1. Introduction 103
2. The HH 110 Jet 105
3. The IRAS 05487+0255 Jet 106
4. The Cepheus E Outflow 107
5. Summary 110

Far-IR Spectrophotometry of HH Flows with the ISO Long-Wavelength Spectrometer

R. Liseau, T. Giannini, B. Nisini, P. Saraceno, L. Spinoglio, B. Larsson, D. Lorenzetti, & E. Tommasi

1. Introduction 112
   1.1 Primary Objectives of the LWS-HH Programme 112
2. HH observations with the LWS 113
3. Results and Discussion 114
   3.1 Extended [CII] 158 μm Emission and Molecular Cloud PDR 114
   3.2 [OI] 63 μm Line Luminosity and Stellar Mass Loss Rate 115
   3.3 [OI] 63 μm Line and Stellar Bolometric Luminosity 119
4. Conclusions 119

II. THE PHYSICS AND CHEMISTRY OF MOLECULAR OUTFLOWS

Observational Properties of Molecular Outflows

R. Padman, S.J. Bence & J.S. Richer

1. Introduction 123
2. Properties of Individual Outflows 124
   2.1 L1551-IRS5 as an Archetype? 124
   2.2 RNO 43: A Jet-Like Outflow 126
3. Properties of the Ensemble 127
   3.1 Statistics 127
   3.2 Implications of Jet-Driven Models 129
   3.3 Implications of Large Scale Outflows 130
4. Outflow Evolution: Where did L 43 come from? 135
5. Conclusion 136
   5.1 Outstanding Problems 136
   5.2 Further Work 137

https://doi.org/10.1017/S0074180900061994 Published online by Cambridge University Press

The Molecular Outflow and CO Bullets in HH 111
J. Cernicharo, R. Neri & B. Reipurth
1. Introduction 141
2. The HH 111 System 143
3. The Low Velocity Outflow 145
4. The High Velocity Gas Along the Herbig-Haro Jet 147
5. The High Velocity Gas at the End of the Herbig-Haro Jet 147
6. The High Velocity Gas Further Away: the CO Bullets 150
7. Molecular Outflows and Herbig-Haro Jets 150

Shock Chemistry in Bipolar Molecular Outflows
R. Bachiller & M. Pérez Gutiérrez
1. Introduction 153
2. Outflows from Class 0 Protostars 154
3. L 1157-mm as an Example of Class 0 Source 155
4. The CO Bipolar Outflow in L 1157 155
5. A Chemical Survey of the L 1157 Outflow 157
6. Spatial Distribution of Different Molecular Species in L 1157 159
7. Chemical Processes 161

Models of Bipolar Molecular Outflows
S. Cabrit, A.C. Raga & F. Gueth
1. Introduction 163
2. Molecular Shells driven by Wide-Angle Winds 164
   2.1 Radially Expanding Momentum-Driven Shells 165
   2.2 Steady Wind-Blown Cavities 167
   2.3 Numerical Simulations 167
3. Steady-State Filled Flows 168
   3.1 Turbulent Mixing-Layers 168
   3.2 Global Infall-Outflow Pattern 169
4. Jet-Driven Bow Shocks 170
   4.1 General Properties of Bow Shocks 170
   4.2 Sideways Motions in Bow Shocks 172
   4.3 Width and Collimation of Jet-Driven Bow Shocks 173
   4.4 Effect of Jet Time Variability 174
      4.4.1 Velocity Variability 175
      4.4.2 Directional Variability 177
5. Conclusions 177

The Physics of Molecular Shocks in YSO Outflows
D.J. Hollenbach
1. Introduction 181
2. Molecular Shock Physics 183
   2.1 Shock Structure: J Shocks and C Shocks 184
   2.2 The Wardle Instability of C Shocks 190
3. Applications 191
   3.1 Aspects of the Two-Shock Picture 191
   3.2 Jets and Wide Angle Winds 192
   3.3 H_2O Masers Associated with YSOs 195

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The Physical and Chemical Effects of C-Shocks in Molecular Outflows

G. Pineau des Forêts, D.R. Flower & J.-P. Chièze

1. Introduction 200
2. Non-Thermal Sputtering of Grains by Shocks in the Interstellar Medium . 200
   2.1 Computed Sputtering Yields 201
   2.2 C-Type Shocks in Dark Molecular Clouds 202
   2.3 Numerical Simulations 204
3. The Temporal Evolution From J- to C-Type Shocks 207
4. Concluding Remarks 211

Herbig-Haro Objects as Searchlights for Dense Cloud Chemistry

S.D. Taylor

1. Introduction 213
2. Observations of Quiescent Emission 214
3. Possible Explanations 215
4. Alternative Model 217
5. Discussion Points 220
   5.1 Clumps in Molecular Outflows 220
   5.2 Mantle Accretion Efficiency 221
   5.3 Hot Core Analogy 221

III. THEORETICAL MODELS

Protostellar X-Rays, Jets, and Bipolar Outflows

F.H. Shu & H. Shang

1. Introduction 225
2. Generalized X-Wind Model 226
3. Evidence from Protostellar X-Rays 229
4. Outline of Mathematical Formulation 230
5. Fixing the Free Functions 232
6. The Cold Limit 233
7. Asymptotic Collimation into Jets 233
8. Bipolar Molecular Outflows 236
9. Stability of Parsec Long Jets 236
10. Crushing the Magnetosphere? 237

Energetics, Collimation and Propagation of Galactic Protostellar Outflows

M. Camenzind

1. Introduction 241
2. Jet Formation 244
   2.1 Jets as Collimated Disk Winds 244
   2.2 Jets as Induced Stellar Winds 247

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3. Rotation and Jet Energy 250
3.1 What drives the Acceleration? 250
3.2 The Light Cylinder of Rapidly Rotating Objects 252
3.3 Plasma Motion along Magnetic Flux-Tubes and Plasma Diagnostics . 252
4. Collimation of MHD Jets: Cylindrical Pinch Solutions 253
5. Propagation of MHD Jets: Knots as Internal Pinch Modes 255
6. Conclusions 257

Numerical Simulations of Jets from Accretion Disks

R.E. Pudritz & R. Ouyed

1. Introduction 259
2. Current Picture of Disk Winds 261
2.1 Numerical Simulations 263
3. Description of Our Model 263
4. Stationary Outflows 265
5. Episodic Outflow 268
6. Transition from Episodic to Stationary Flow 271
7. Conclusions 272

Asymptotic Structure of Rotating MHD Winds and Its Relation to Wind Boundary Conditions

J. Heyvaerts & C.A. Norman

1. Introduction 275
2. General Properties of Magnetized Rotating Winds 276
2.1 Representation of the Magnetic Field 276
2.2 Surface Functions 277
2.3 Alfvén Density and Radius 278
2.4 Transfield Equation 278
2.5 Criticality Equations 279
2.6 Alfvén Regularity Equation 279
3. The Asymptotic Transfield Equation 281
3.1 Asymptotic Hamilton-Jacobi Equation 282
3.2 Asymptotic Parabolic Solution 283
3.3 A Necessary Condition for Cylindrical Asymptotics 284
4. A Simplified Model 285
4.1 Description of the Model 285
4.2 Semi-Numerical Results for Confined Jets 286
4.3 Analytical Solution for Very Fast Rotators 286
5. Winds, Breezes and Asymptotics 289

Hydrodynamic Collimation of YSO Jets

A. Frank & G. Mellema

1. Introduction 291
2. Numerical Method 292
3. Results without Cooling 294
4. Results with Cooling 294
5. The Effect of Wind Variability 298
6. Connection to Observations 300
7. Conclusions 301

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The Class 0 Outflow Hammered Out?
M.D. Smith, R. Völker, G. Suttner & H.W. Yorke
1. Introduction 303
2. The Hammer Jet 304
3. Lobe Asymmetries 306
4. Tubular CO 308
5. Proper Motions 310
6. Conclusions 312

Numerical Simulations of Optical Knots in YSO Outflows
F. Rubini, S. Lorusso, C. Giovanardi & F. Leeuwin
1. Introduction 313
2. Non-Stationary Dynamics of Stellar Jets and Formation of Internal Shocks 315
3. Jet Parameters and Observational Constraints 316
4. The Model and the Numerical Code 317
4.1 Chemical Evolution and Related Energy Terms 317
4.2 Numerical Code 318
5. Numerical Results 318
6. Conclusions 320

Asymmetric Modes of the Kelvin-Helmholtz Instability in Protostellar Jets
J.M. Stone
1. Introduction 323
2. Problem Setup 324
3. Linear Analysis 326
4. Nonlinear Hydrodynamical Simulations 328
5. Summary 331

Kelvin-Helmholtz Instabilities and the Emission Knots in Herbig-Haro Jets
S. Massaglia, M. Micono, A. Ferrari, G. Bodo & P. Rossi
1. Introduction 335
2. The Physical Problem 337
3. Conclusions 339

On the Energetics and Momentum Distribution of Bow Shocks and Colliding Winds
F.P. Wilkin, J. Cantó & A.C. Raga
1. Introduction 343
2. The Stellar Wind Bow Shock Model 345
3. Application to Jet Bow Shocks and Molecular Outflows? 348
4. Two Wind Collision in Binaries 351

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IV. DISKS, WINDS, AND MAGNETIC FIELDS

Hubble Space Telescope Imaging of the Disks and Jets of Taurus Young Stellar Objects

K. Stapelfeldt, C.J. Burrows, J.E. Krist & the WFPC2 Science Team

1. Introduction 355
2. Observations 356
3. Results for Point Sources with Adjacent Nebulosity 356
   - 3.1 T Tauri 356
   - 3.2 XZ Tauri 357
   - 3.3 FS Tauri (Haro 6-5) 358
   - 3.4 DG Tauri 358
   - 3.5 GM Aurigae 358
   - 3.6 SAO 76411A & HDE 283572 359
4. Results for Entirely Nebulous Objects 359
   - 4.1 HL Tauri 359
   - 4.2 HH 30 359
   - 4.3 FS Tauri B (Haro 6-5B) 361
   - 4.4 DG Tauri B 361
5. Discussion 362
6. Future Prospects 363

Disks and Outflows as seen from the IRAM Interferometer

S. Guilloteau, A. Dutrey & F. Gueth

1. Introduction 365
2. Outflows from Class 0 Objects 366
   - 2.1 L 1448 366
   - 2.2 L 1157 367
   - 2.3 HH 211 369
   - 2.4 Conclusions 371
3. Infalling Envelopes? 371
4. Disks around T Tauri Stars 372
   - 4.1 Dust Disks 372
   - 4.2 Gas Disks Kinematics 374
   - 4.3 Binaries 376
   - 4.4 Disk Masses from Dust 377
   - 4.5 Disk Masses from Gas 378
5. Conclusions 379

NMA Imaging of Envelopes and Disks around Low Mass Protostars and T Tauri Stars

Y. Kitamura, M. Saito, R. Kawabe & K. Sunada

1. Background 382
2. Our Survey 384
3. Results and Discussion 384
   - 3.1 Disklike Envelopes around Typical Protostars, B335 and L1551 IRS5 384
   - 3.2 New Scenario for Evolution of Disklike Envelopes around Protostars . 385

https://doi.org/10.1017/S0074180900061994 Published online by Cambridge University Press

3.3 Compact Disks around Classical T Tauri Stars 388
4. Our Future Studies 389

The Observational Evidence for Accretion

L. Hartmann

1. Introduction 391
2. FU Ori Accretion 393
3. T Tauri Accretion 396
4. Implications for Magnetospheres and Wind Ejection 398

The Radiative Impact of FU Orionis Outbursts on Protostellar Envelopes

K.R. Bell & K.M. Chick

1. Introduction 407
2. FU Orionis Outbursts 409
3. Method 412
4. Results 412
5. Discussion 414
6. Future Work 415

Properties of the Winds of T Tauri Stars

N. Calvet

1. Introduction 417
2. Wind Indicators. Separating Magnetosphere and Wind 418
3. Origin of the Wind 421
3.1 The FU Ori Wind 422
3.2 The Region of Origin of TTS Winds 422
3.3 Forbidden Lines. Extended Region 425
4. Mass Loss Rates 427
4.1 Forbidden Lines 427
4.2 Permitted Lines 429
5. Summary and Conclusions 431

Magnetospherically Mediated Accretion in Classical T Tauri Stars

S. Edwards

1. Introduction 433
2. Observational Evidence for Magnetosperic Accretion 435
2.1 Support for Funnel Flows 435
2.2 Challenges to Funnel Flows 436
3. Permitted Metallic Lines as Funnel Flow Diagnostics? 437
4. Discussion and Future Prospects 440

https://doi.org/10.1017/S0074180900061994 Published online by Cambridge University Press

Jets, Disk Winds, and Warm Disk Coronae in Classical T Tauri Stars

J. Kwan

1. Introduction 443
2. Two Components of Mass Ejection: a Jet and a Disk Wind 444
3. A Warm Disk Corona 448
   3.1 [OI] λλ6300,5577 Emission 448
   3.2 Balmer Line Central Absorption 450
4. Discussion 452

Thermal Structure of Magnetic Funnel Flows

S.C. Martin

1. Introduction 455
2. Gas Dynamics 456
3. Gas Thermodynamics 457
4. Observational Implications 458
5. Conclusions 461

Magnetic Fields of T Tauri Stars

E.W. Guenther

1. Introduction 465
2. Methods to Measure Magnetic Fields 467
   2.1 Changes of the Equivalent Width 467
   2.2 The Line-Broadening Method 468
3. Selection Criteria of the Objects 468
4. Measurements of the Magnetic Field Strength 470
5. Conclusions 472
6. Outlook 473

Evidence for Magnetic Fields in the Outflow from T Tau S

T.P. Ray, T.W.B. Muxlow, D.J.Axon, A. Brown, D.Corcoran, J.E. Dyson & R. Mundt

1. Introduction and Observational Details 476
2. Results 476

V. LOW- AND HIGH-MASS PROTOSTARS AND THEIR ENVIRONMENT

The Evolution of Flows and Protostars

P. André

1. Introduction 483
   1.1 Tracking YSO Evolution 483
   1.2 Defining Properties of Class 0 Protostars 485
2. Evidence for a Decline of Outflow/Inflow Power with Time 485
   2.1 Interpretation of the Observed Outflow Evolution 487

https://doi.org/10.1017/S0074180900061994 Published online by Cambridge University Press

3. Link to the Initial Conditions of Star Formation 488
4. Suggested Collapse Scenario 489
4.1 Accretion Luminosities of Class 0 and Class I Sources 491
4.2 Differences between Ophiuchus and Taurus 492
5. Conclusions 493

Circumstellar Molecular Envelopes

G.A. Fuller & E.F. Ladd

1. Introduction 495
2. Rare Species of CO as Probes 497
3. Mass of Circumstellar Material 498
4. The Temperature of the Circumstellar Material 499
5. The Velocity Dispersion of the Circumstellar Material 500
6. Variation of Column Density with T_{bol} 501
6.1 Outflow 501
6.2 Infall 503
6.3 Outflow and Infall? 504
7. The Structure of the Circumstellar Environment 505

Millimeter Interferometry of Class 0 Sources: Rotation and Infall Towards L1448N

S. Terebey & D.L. Padgett

1. Introduction 507
2. Observations 508
3. Results 508
3.1 Overview of L1448 Cloud Core 508
3.2 Embedded Protostellar Sources 509
3.3 Fragmentation and Rotation 510
3.4 The 2000 AU Protobinary 510
3.5 Infall 511
4. Conclusions 512

Water Masers toward Low-Luminosity Young Stellar Objects

M.J. Claussen, K.B. Marvel, H.A. Wootten & B.A. Wilking

1. Introduction 515
2. Why Study Water Masers toward YSOs? 516
3. Single Antenna Water Maser Monitoring Survey 517
4. Assorted VLA Observations 518
5. VLBA Observations of Water Masers in IRAS05413−0104 520
6. Summary 522

Massive Star Formation: Observational Constraints

E. Churchwell

1. Introduction 525
2. Stellar Luminosity and Outflow Properties 525
3. The Frequency of Massive Star Outflows 526
4. Outflow Properties 527
5. Interferometric Observations 529

https://doi.org/10.1017/S0074180900061994 Published online by Cambridge University Press

6. Origin of the Mass in Massive Outflows 530
6.1 Accumulated Stellar Winds 531
6.2 Entrained ISM in Stellar Bipolar Jets 531
6.3 Swept-Up ISM 532
6.4 Accretion Driven Outflows 533
7. Summary 535

Low-Mass Versus High-Mass Star Formation

T.W. Hartquist & J.E. Dyson

1. Introduction 537
2. The Scale of Response 538
3. Triggering Clump or Core Collapse 540
4. Ways in Which Star Formation May Hinder Further Star Formation 542
5. Global Properties of Mass-Loaded Flows in Clumpy Star Forming Regions 546
6. Conclusions 547

Orion Proplyds and The Eagle's Eggs

M.J. McCaughrean

1. Introduction 551
2. Circumstellar Disks in the Orion Nebula 552
2.1 Detection via IR Excess 552
2.2 Detection as Ionized Proplyds 553
2.3 Detection as Silhouettes 554
3. Star Formation in the M 16 Elephant Trunks 555
4. Summary and Prospects 559

Two-Wind Interaction Models of the Proplyds in the Orion Nebula

W.J. Henney & S.J. Arthur

1. Introduction 561
2. Confinement Mechanisms - Radiation vs. Ram Pressure 562
3. Analytic Two-Wind Models 564
4. Comparison with Observations 565
5. Hydrodynamical Simulations 566
6. Discussion and Speculation 568

Conference Summary

A.C. Raga

1. Introduction 571
2. Papers Presented at the Meeting 572
3. Observational Results 573
4. Theoretical Results 576
5. Final Speculations 577

List of Participants 589

List of Poster Papers 593

https://doi.org/10.1017/S0074180900061994 Published online by Cambridge University Press

PREFACE

Herbig-Haro objects were discovered 50 years ago, and during this half century they have developed from being mysterious small nebulae to becoming an important phenomenon in star formation. Indeed, HH flows are now recognized not only as fascinating astrophysical laboratories involving shock physics and chemistry, hydrodynamics and radiation processes, but it has gradually been realized that HH flows hold essential clues to the birth and early evolution of low mass stars.

IAU Symposium No. 182 on *Herbig-Haro Flows and the Birth of Low Mass Stars* were held from January 20 to 24, 1997 in Chamonix in the french alps. A total of 178 researchers from 26 countries met to discuss our present level of understanding of Herbig-Haro flows and their relation to disk accretion events and T Tauri winds and other outflow phenomena like molecular outflows, embedded molecular hydrogen flows and radio jets. The present book contains the manuscripts from the oral contributions of the symposium. The poster papers were printed in a separate volume *Low Mass Star Formation – from Infall to Outflow*, edited by Fabien Malbet and Alain Castets, which was distributed at the beginning of the meeting. Together these two books document the vigorous state and the scientific appeal which research into Herbig-Haro flows and related issues in star formation enjoys today, observationally as well as theoretically.

To organize a major symposium like the present one requires the generous support of many people and organisations. We gratefully acknowledge the financial support of the International Astronomical Union, the Grenoble Observatory and its Astrophysics Laboratory (LAOG), the Institute for Millimetric Radioastronomy (IRAM), IBM, the Joseph Fourier University at Grenoble (UJF), the National Center for Scientific Research (CNRS), the French Ministry for Foreign Affairs (MAE), the regional (Région Rhône-Alpes) and local authorities (Conseil Général de Haute-Savoie and Mairie de Chamonix-Mont Blanc). The practical support provided by the Chamonix Tourist Office and the Grenoble Observatory was indispensable. Finally, the hard work of the Local and Scientific Organizing Committees contributed greatly to the success of the Symposium. To all, our warmest thanks.

Bo Reipurth and Claude Bertout

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