

# BRETT H. ANDREWS

## *Curriculum Vitae*

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EXPERIENCE	<b>Research Assistant Professor</b> Department of Physics and Astronomy, University of Pittsburgh	2017–present
	<b>Postdoctoral Associate</b> Department of Physics and Astronomy, University of Pittsburgh	2014–2017
EDUCATION	<b>Ph.D. Astronomy</b> The Ohio State University “Decoding Galaxy Evolution with Gas-phase and Stellar Elemental Abundances” Advisors: David H. Weinberg & Jennifer A. Johnson	2014
	<b>M.S. Astronomy</b> The Ohio State University	2011
	<b>B.S. Physics &amp; Astronomy</b> Yale University	2008
PUBLICATIONS	4 lead author; 8 significant contributing author; 52 contributing author; 3 non-refereed. List attached.	
PRESENTATIONS	4 invited; 25 contributed; 2 posters. List attached.	
FUNDING	<b>PI: NSF Astronomy and Astrophysics Research Grants</b> Interpretable and Deblended Photometric Redshifts with a Deep Capsule Network <b>\$535,578</b>	2020–present
	<b>Co-I: NASA Astrophysical Data Analysis Program</b> Multiwavelength Milky Way Analogs <b>\$504,949</b>	2019–present
	<b>Co-I: NASA Astrophysical Data Analysis Program (Funded Extension)</b> Multiwavelength Milky Way Analogs <b>\$33,707</b>	2021
	<b>Senior Personnel: NSF Major Research Instrumentation Program</b> Acquisition of Cutting-Edge GPU and MPI Nodes for the Interdisciplinary Pitt Center for Research Computing <b>\$1,187,606</b>	2021–2024
HONORS	<b>SDSS-IV/MaNGA Architect</b>	2016–present
	<b>Hayes Graduate Research Forum Oral Presentation Finalist</b> The Ohio State University	2011, 2013
	<b>Nicolas Adamo Scholar-Athlete Prize</b> Silliman College, Yale University	2008

SOFTWARE	<b>flexCE</b> Python package for modeling galactic chemical evolution.	
	<b>Marvin</b> Python package, RESTful API, and Flask web application for accessing, visualizing, and analyzing SDSS-IV MaNGA integral-field spectroscopic data.	
MENTORING	Ph.D. <b>Troy Raen</b> (University of Pittsburgh) “Toward the Study of Stars with LSST”	2019–present
	<b>Biprateep Dey</b> (University of Pittsburgh) “Estimating Photometric Redshifts with Deep Capsule Networks”	2018–present
	<b>Catherine Fielder</b> (University of Pittsburgh) “Selecting Milky Way Analog Galaxies”	2018–present
	<b>Ashod Khederlarian</b> (University of Pittsburgh) “Characterizing Incompleteness in Spectroscopic Training Sets for Photometric Redshift Estimation”	2022–present
	<b>Yoquelbin Salcedo Hernandez</b> (University of Pittsburgh) “DESI-2 Emission Line Galaxy Target Selection”	2022–present
	M.S. <b>Quanbin (Eric) Ma</b> (Carnegie Mellon University Machine Learning Department) “Deep Dimensionality Reduction of MaNGA Data”	2017
	Undergraduate <b>Katie Mack</b> (University of Pittsburgh) “Comparing Stellar and Emission Line Dust Attenuation in the LEGA-C Survey”	2021–present
Undergraduate	<b>Zach Lewis</b> (University of Pittsburgh) “The Mass–Metallicity Relation at Intermediate Redshifts”	2019–present
	<b>Ian Cooper</b> (University of Pittsburgh) “SNIa Hosts in MaNGA”	2016
	High School <b>Mariah Jones</b> (Baldwin High School) “The Mass–Metallicity Relation at Intermediate Redshifts”	2020–2021

TEACHING	<b>AstroPGH Python Boot Camp and Summer Seminar Series</b> (University of Pittsburgh, and Carnegie Mellon University) Organized event for summer undergraduate and graduate students. Presented lecture on Python and Jupyter.	2022
	<b>AstroPGH-TAMU Python Boot Camp and Summer Seminar Series</b> (University of Pittsburgh, Carnegie Mellon University, and Texas A&M University) Organized event for summer undergraduate and graduate students. Presented two lectures on Numpy and Pandas.	2021
	<b>AstroPGH Boot Camp and Summer Seminar Series</b> (University of Pittsburgh and Carnegie Mellon University) Organized event for summer undergraduate and graduate students. Presented eight lectures on Python basics, Astropy, Pandas, Git, and GitHub.	2020
	<b>Data Science Group Meeting</b> (University of Pittsburgh) Organized event series for astrophysics graduate students.	2018
	<b>Marvin Workshops</b> (SDSS-IV Collaboration Meetings) Led introductory workshops for users of the Marvin software toolkit.	2015–2017
	<b>Python Boot Camps</b> (University of Pittsburgh) Led events for undergraduate and graduate students.	2015
OUTREACH	<b>Astronomy on Tap</b> “The Origin of the Elements” “Indiana Jones and the Hidden Galaxy” w/ Courtney Epstein	2018 2014
	<b>Learn &amp; Earn Corporate Host</b> Hosted intern for summer youth employment program delivered by Allegheny County, the City of Pittsburgh, and Partner4Work.	2021
	<b>Science Olympiad</b> Coached Grandview Heights (Ohio) Middle School team.	2011
SERVICE TO PROFESSION	<b>Invited referee for <i>ApJ</i>, <i>MNRAS</i>, and <i>PASP</i></b>	
	<b>Invited reviewer for NSF</b>	
	<b>Faculty Hiring Committee</b> Department of Physics and Astronomy, University of Pittsburgh - Astrophysics or Experimental High Energy Physics With Machine Learning - LSSST LINCC Research Assistant Professor	2018–2019 2022
	<b>Faculty Peer Buddy</b> University of Pittsburgh	2021–present

# BRETT H. ANDREWS

## *Publications*

- |                                 |   |
|---------------------------------|---|
| LEAD AUTHOR                     | <ol style="list-style-type: none"><li>4. <b>Andrews, B. H.</b>, et al., 2017, <i>The Astrophysical Journal</i>, 835, 224<br/>Inflow, Outflow, Yields, and Stellar Population Mixing in Chemical Evolution Models</li><li>3. <b>Andrews, B. H.</b> &amp; Martini, P., 2013, <i>The Astrophysical Journal</i>, 765, 140<br/>The Mass-Metallicity Relation with the Direct Method on Stacked Spectra of SDSS Galaxies</li><li>2. <b>Andrews, B. H.</b>, et al., 2012, <i>Acta Astronomica</i>, 62, 269<br/>Principal Component Abundance Analysis of Microlensed Bulge Dwarf and Subgiant Stars</li><li>1. <b>Andrews, B. H.</b> &amp; Thompson, T. A., 2011, <i>The Astrophysical Journal</i>, 727, 97<br/>Assessing Radiation Pressure as a Feedback Mechanism in Star-forming Galaxies</li></ol>  |
| SIGNIFICANT CONTRIBUTING AUTHOR | <ol style="list-style-type: none"><li>8. Dey, B., Zhao, D., Newman, J. A., <b>Andrews, B. H.</b>, et al., 2022, <i>arXiv:stat/2205.14568</i><br/>Calibrated Predictive Distributions via Diagnostics for Conditional Coverage</li><li>7. Kodra, D., <b>Andrews, B. H.</b>, et al., 2022, submitted to <i>The Astrophysical Journal</i><br/>Optimized Photometric Redshifts for the Cosmic Assembly Near-Infrared Deep Extragalactic Legacy Survey (CANDELS)</li><li>6. Dey, B., <b>Andrews, B. H.</b>, et al., 2021, <i>arXiv:astro-ph/2112.03939</i><br/>Photometric Redshifts from SDSS Images with an Interpretable Deep Capsule Network</li><li>5. Dey, B., Newman, J. A., <b>Andrews, B. H.</b>, et al., 2021, <i>arXiv:astro-ph/2110.15209</i><br/>Re-calibrating Photometric Redshift Probability Distributions Using Feature-space Regression</li><li>4. Fielder, C. E., Newman, J. A., <b>Andrews, B. H.</b>, et al., 2021, <i>Monthly Notices of the Royal Astronomical Society</i>, 508, 4459<br/>Constraining the Milky Way's ultraviolet-to-infrared SED with Gaussian process regression</li><li>3. Cherinka, B., <b>Andrews, B. H.</b>, et al., 2019, <i>The Astronomical Journal</i>, 158, 74<br/>Marvin: A Tool Kit for Streamlined Access and Visualization of the SDSS-IV MaNGA Data Set</li><li>2. Weinberg, D. H., <b>Andrews, B. H.</b>, &amp; Freudenburg, J., 2017, <i>The Astrophysical Journal</i>, 837, 183<br/>Equilibrium and Sudden Events in Chemical Evolution</li><li>1. Brown, J. S., Martini, P., &amp; <b>Andrews, B. H.</b>, 2016, <i>Monthly Notices of the Royal Astronomical Society</i>, 458, 1529<br/>A recalibration of strong-line oxygen abundance diagnostics via the direct method and implications for the high-redshift universe</li></ol> |
| CONTRIBUTING AUTHOR             | <ol style="list-style-type: none"><li>52. Boardman, N., et al., 2022, <i>arXiv:astro-ph/2205.08241</i><br/>How well do local relations predict gas-phase metallicity gradients? Results from SDSS-IV MaNGA</li><li>51. Schaefer, A. L., et al., 2022, <i>The Astrophysical Journal</i>, 930, 2<br/>SDSS-IV MaNGA: Exploring the Local Scaling Relations for N/O</li><li>50. Abdurro'uf, et al., 2021, <i>The Astrophysical Journal Supplement Series</i>, 259, 2<br/>The Seventeenth Data Release of the Sloan Digital Sky Surveys: Complete Release of MaNGA, MaStar, and APOGEE-2 Data</li><li>49. Law, D., et al., 2020, <i>The Astrophysical Journal</i>, 915, 35<br/>SDSS-IV MaNGA: Refining Strong Line Diagnostic Classifications Using Spatially Resolved Gas Dynamics</li><li>48. Parikh, T., et al., 2021, <i>Monthly Notices of the Royal Astronomical Society</i>, 502, 5508<br/>SDSS-IV MaNGA: radial gradients in stellar population properties of early-type and late-type galaxies</li></ol>  |

47. Greener, M., et al., 2021, *Monthly Notices of the Royal Astronomical Society*, 502, 95  
SDSS-IV MaNGA: the ‘G-dwarf problem’ revisited
46. Luo, Y., et al., 2021, *The Astrophysical Journal*, 908, 183  
Evidence for the Accretion of Gas in Star-forming Galaxies: High N/O Abundances in Regions of Anomalously Low Metallicity
45. Mazzola, C., et al., 2020, *Monthly Notices of the Royal Astronomical Society*, 499, 1607  
The close binary fraction as a function of stellar parameters in APOGEE: a strong anticorrelation with  $\alpha$  abundances
44. Boardman, N., et al., 2020, *Monthly Notices of the Royal Astronomical Society*, 498, 4943  
Are the Milky Way and Andromeda unusual? A comparison with Milky Way and Andromeda analogues
43. Fraser-McKelvie, A., et al., 2020, *Monthly Notices of the Royal Astronomical Society*, 495, 4158  
SDSS-IV MaNGA: spatially resolved star formation in barred galaxies
42. Ahumada, R., et al., 2020, *The Astrophysical Journal Supplement Series*, 249, 3  
The 16th Data Release of the Sloan Digital Sky Surveys: First Release from the APOGEE-2 Southern Survey and Full Release of eBOSS Spectra
41. Greener, M. J., et al., 2020, *Monthly Notices of the Royal Astronomical Society*, 495, 2305  
SDSS-IV MaNGA: spatially resolved dust attenuation in spiral galaxies
40. Schaefer, A. L., et al., 2020, *The Astrophysical Journal*, 890, L3  
SDSS-IV MaNGA: Variations in the N/O-O/H Relation Bias Metallicity Gradient Measurements
39. Boardman, N., et al., 2020, *Monthly Notices of the Royal Astronomical Society*, 491, 3672  
Milky Way analogues in MaNGA: multiparameter homogeneity and comparison to the Milky Way
38. Westfall, K. B., et al., 2019, *The Astronomical Journal*, 158, 231  
The Data Analysis Pipeline for the SDSS-IV MaNGA IFU Galaxy Survey: Overview
37. Fraser-McKelvie, A., et al., 2019, *Monthly Notices of the Royal Astronomical Society*, 488, L6  
SDSS-IV MaNGA: stellar population gradients within barred galaxies
36. Pace, Z. J., et al., 2019, *The Astrophysical Journal*, 883, 83  
Resolved and Integrated Stellar Masses in the SDSS-IV/MaNGA Survey. II. Applications of PCA-based Stellar Mass Estimates
35. Pace, Z. J., et al., 2019, *The Astrophysical Journal*, 883, 82  
Resolved and Integrated Stellar Masses in the SDSS-IV/MaNGA Survey. I. PCA Spectral Fitting and Stellar Mass-to-light Ratio Estimates
34. Zhang, K., et al., 2019, *The Astrophysical Journal*, 883, 63  
Machine-learning Classifiers for Intermediate Redshift Emission-line Galaxies
33. Oyarzún, G. A., et al., 2019, *The Astrophysical Journal*, 880, 111  
Signatures of Stellar Accretion in MaNGA Early-type Galaxies
32. Parikh, T., et al., 2019, *Monthly Notices of the Royal Astronomical Society*, 483, 3420  
SDSS-IV MaNGA: local and global chemical abundance patterns in early-type galaxies
31. Aguado, D. S., et al., 2019, *The Astrophysical Journal Supplement Series*, 240, 23  
The Fifteenth Data Release of the Sloan Digital Sky Surveys: First Release of MaNGA-derived Quantities, Data Visualization Tools, and Stellar Library
30. Hwang, H.-C., et al., 2019, *The Astrophysical Journal*, 872, 144  
Anomalously Low-metallicity Regions in MaNGA Star-forming Galaxies: Accretion Caught in Action?
29. Li, H., et al., 2019, *The Astrophysical Journal*, 872, 63  
Interpreting the Star Formation-Extinction Relation with MaNGA
28. Zasowski, G., et al., 2019, *The Astrophysical Journal*, 870, 138  
APOGEE DR14/DR15 Abundances in the Inner Milky Way
27. Rowlands, K., et al., 2018, *Monthly Notices of the Royal Astronomical Society*, 480, 2544  
SDSS-IV MaNGA: spatially resolved star formation histories and the connection to galaxy physical properties

26. Parikh, T., et al., 2018, *Monthly Notices of the Royal Astronomical Society*, 477, 3954  
SDSS-IV MaNGA: the spatially resolved stellar initial mass function in  $\sim 400$  early-type galaxies
25. Penny, S. J., et al., 2018, *Monthly Notices of the Royal Astronomical Society*, 476, 979  
SDSS-IV MaNGA: evidence of the importance of AGN feedback in low-mass galaxies
24. Abolfathi, B., et al., 2018, *The Astrophysical Journal Supplement Series*, 235, 42  
The Fourteenth Data Release of the Sloan Digital Sky Survey: First Spectroscopic Data from the Extended Baryon Oscillation Spectroscopic Survey and from the Second Phase of the Apache Point Observatory Galactic Evolution Experiment
23. Talbot, M. S., et al., 2018, *Monthly Notices of the Royal Astronomical Society*, 477, 195  
SDSS-IV MaNGA: the spectroscopic discovery of strongly lensed galaxies
22. Wylezalek, D., et al., 2018, *Monthly Notices of the Royal Astronomical Society*, 474, 1499  
SDSS-IV MaNGA: identification of active galactic nuclei in optical integral field unit surveys
21. Badenes, C., et al., 2018, *The Astrophysical Journal*, 854, 147  
Stellar Multiplicity Meets Stellar Evolution and Metallicity: The APOGEE View
20. Albareti, F. D., et al., 2017, *The Astrophysical Journal Supplement Series*, 233, 25  
The 13th Data Release of the Sloan Digital Sky Survey: First Spectroscopic Data from the SDSS-IV Survey Mapping Nearby Galaxies at Apache Point Observatory
19. Greene, J. E., et al., 2017, *The Astrophysical Journal*, 851, L33  
SDSS-IV MaNGA: Probing the Kinematic Morphology-Density Relation of Early-type Galaxies with MaNGA
18. Zasowski, G., et al., 2017, *The Astronomical Journal*, 154, 198  
Target Selection for the SDSS-IV APOGEE-2 Survey
17. Zahid, H. J., et al., 2017, *The Astrophysical Journal*, 847, 18  
Stellar Absorption Line Analysis of Local Star-forming Galaxies: The Relation between Stellar Mass, Metallicity, Dust Attenuation, and Star Formation Rate
16. Martínez-Rodríguez, H., et al., 2017, *The Astrophysical Journal*, 843, 35  
Observational Evidence for High Neutronization in Supernova Remnants: Implications for Type Ia Supernova Progenitors
15. Blanton, M. R., et al., 2017, *The Astronomical Journal*, 154, 28  
Sloan Digital Sky Survey IV: Mapping the Milky Way, Nearby Galaxies, and the Distant Universe
14. Linden, S. T., et al., 2017, *The Astrophysical Journal*, 842, 49  
Timing the Evolution of the Galactic Disk with NGC 6791: An Open Cluster with Peculiar High- $\alpha$  Chemistry as Seen by APOGEE
13. Zhang, K., et al., 2017, *Monthly Notices of the Royal Astronomical Society*, 466, 3217  
SDSS-IV MaNGA: the impact of diffuse ionized gas on emission-line ratios, interpretation of diagnostic diagrams and gas metallicity measurements
12. Jones, A., et al., 2017, *Astronomy and Astrophysics*, 599, A141  
SDSS IV MaNGA: Deep observations of extra-planar, diffuse ionized gas around late-type galaxies from stacked IFU spectra
11. Yan, R., et al., 2016, *The Astronomical Journal*, 152, 197  
SDSS-IV MaNGA IFS Galaxy Survey—Survey Design, Execution, and Initial Data Quality
10. Law, D. R., et al., 2016, *The Astronomical Journal*, 152, 83  
The Data Reduction Pipeline for the SDSS-IV MaNGA IFU Galaxy Survey
9. Holtzman, J. A., et al., 2015, *The Astronomical Journal*, 150, 148  
Abundances, Stellar Parameters, and Spectra from the SDSS-III/APOGEE Survey
8. Hayden, M. R., et al., 2015, *The Astrophysical Journal*, 808, 132  
Chemical Cartography with APOGEE: Metallicity Distribution Functions and the Chemical Structure of the Milky Way Disk
7. Alam, S., et al., 2015, *The Astrophysical Journal Supplement Series*, 219, 12  
The Eleventh and Twelfth Data Releases of the Sloan Digital Sky Survey: Final Data from SDSS-III

6. Nidever, D. L., et al., 2014, *The Astrophysical Journal*, 796, 38  
Tracing Chemical Evolution over the Extent of the Milky Way's Disk with APOGEE Red Clump Stars
5. Bovy, J., et al., 2014, *The Astrophysical Journal*, 790, 127  
The APOGEE Red-clump Catalog: Precise Distances, Velocities, and High-resolution Elemental Abundances over a Large Area of the Milky Way's Disk
4. Ahn, C. P., et al., 2014, *The Astrophysical Journal Supplement Series*, 211, 17  
The Tenth Data Release of the Sloan Digital Sky Survey: First Spectroscopic Data from the SDSS-III Apache Point Observatory Galactic Evolution Experiment
3. Leja, J., et al., 2013, *The Astrophysical Journal*, 778, L24  
Exploring the Chemical Link between Local Ellipticals and Their High-redshift Progenitors
2. Zasowski, G., et al., 2013, *The Astronomical Journal*, 146, 81  
Target Selection for the Apache Point Observatory Galactic Evolution Experiment (APOGEE)
1. Ahn, C. P., et al., 2012, *The Astrophysical Journal Supplement Series*, 203, 21  
The Ninth Data Release of the Sloan Digital Sky Survey: First Spectroscopic Data from the SDSS-III Baryon Oscillation Spectroscopic Survey

NON-REFEREED

3. Cherinka, B., et al., 2020, *ASPC*, 527, 743C  
Marvin: A Toolkit for Streamlined Access and Visualisation of the SDSS-IV MaNGA Data Set
2. Wilson, J. C., et al., 2012, *SPIE*, 8446, 84460H  
Performance of the Apache Point Observatory Galactic Evolution Experiment (APOGEE) high-resolution near-infrared multi-object fiber spectrograph
1. **Andrews, B. H.** & Thompson, T. A., 2011, *EAS Publications Series*, 52, 275  
Radiation Pressure Feedback in Galaxies

# BRETT H. ANDREWS

## *Presentations*

INVITED	Effective Plotting	2021
	DESI Collaboration Meeting	
	Hidden in Plain Sight: a Deep Learning Approach to Finding Supernovae in Galaxy Maps	2018
	Science 2018, University of Pittsburgh	
	The SDSS-IV MaNGA Survey: Galaxy Dissection on an Industrial Scale	2017
	CMU Astro Seminar, Carnegie Mellon University	
	The Mass–Metallicity Relation in SDSS Using Electron Temperature Measurements	2015
	Understanding Nebular Emission in High-Redshift Galaxies, The Carnegie Observatories	
CONTRIBUTED	Effective Plotting	2021
	AstroPGH Summer Seminar, University of Pittsburgh	
	Effective Plotting	2020
	AstroPGH Summer Seminar, University of Pittsburgh	
	Effective Plotting	2018
	Astro Student Seminar, University of Pittsburgh	
	GitHub Flow	2018
	Astro Student Seminar, University of Pittsburgh	
	MaNGA DAP	2017
	SDSS-IV Collaboration Meeting, Pontificia Universidad Católica de Chile	
	Streamlining MaNGA Data with Marvin	2017
	AstroLunch, University of Pittsburgh	
	The State of Marvin	2016
	SDSS-IV Collaboration Meeting, University of Wisconsin	
	AstroCoffee Presentation Advice	2016
	Astro Student Seminar, University of Pittsburgh	
	Marvin-tools: Distilling DAP Measurements and & Stacking Spectra	2016
	MaNGA Collaboration Meeting (Cocoa Beach, FL)	
	Global vs. Resolved Metallicities	2015
	Astro Student Seminar, University of Pittsburgh	
	Global vs. Resolved Metallicities	2015
	SDSS-IV Collaboration Meeting, Instituto Física Teórica Universidad Autónoma de Madrid	
	MaNGA Data Analysis Pipeline Quality Assessment	2015
	MaNGA Collaboration Meeting, University of Kentucky	
	Principal Component Abundance Analysis: APOGEE and flexCE	2015
	Local Group Astrostatistics Conference, University of Michigan	
	Understanding the Bimodality in $[\alpha/\text{Fe}]$ with a Chemical Evolution Model	2014
	SDSS-III Collaboration Meeting (Park City, UT)	
	Applying Principal Component Analysis to APOGEE	2014
	SDSS-IV Collaboration Meeting (Park City, UT)	
	Exploiting Large Multi-element Stellar Abundance Surveys	2014
	AAS Winter Meeting	
	Decoding Galactic Chemical Evolution with Gas-phase and Stellar Abundances	2013
	Colloquium, University of Wisconsin	
	Yields, Delays, and Mixing in Chemical Evolution Models	2013
	SDSS-II Collaboration Meeting, Johns Hopkins University	
	Decoding Galactic Chemical Evolution with Gas-phase and Stellar Abundances	2013
	Yale Center for Astronomy & Astrophysics Seminar, Yale University	
	The Mass–Metallicity Relation: A Window Into Galaxy Evolution	2013
	Seminar, National Radio Astronomical Observatory	



	The Galaxy Mass–Metallicity Relation: A Sensitive Diagnostic of the Processes That Drive Galaxy Evolution	2013
	Edward F. Hayes Graduate Research Forum, The Ohio State University	
	Characterizing the Distribution of Stars in Chemical Abundance Space	2013
	APOGEE Collaboration Meeting, The Carnegie Observatories	
	Accounting for Stellar Abundance Uncertainties in Principal Component Abundance Analysis	2012
	APOGEE Collaboration Meeting, Texas Christian University	
	Principal Component Abundance Analysis: Finding the Principal Components of Chemical Abundance Space	2011
	SDSS-III Collaboration Meeting, Vanderbilt University	
	Radiation Pressure Feedback in Galaxies	2011
	Edward F. Hayes Graduate Research Forum, The Ohio State University	
POSTERS	Principal Component Abundance Analysis and Chemical Evolution Models	2014
	The Near-Field Deep-Field Connection, University of California, Irvine	
	Assessing Radiation Pressure as a Feedback Mechanism in Star-forming Galaxies	2011
	The 5th Zermatt ISM Symposium	