

## **Brian G. Keating**

Center for Astrophysics and Space Sciences, University of California San Diego

### **Professional Preparation:**

Case Western Reserve University, Cleveland, OH: (Physics), BS, 1993  
Brown University, Providence, RI, (Physics), MS, 1995, PhD, 2000  
Stanford University, Palo Alto, CA, (Physics), Postdoctoral Scholar, 1999-2000  
California Institute of Technology, Pasadena, CA, NSF Postdoctoral Fellow, 2001-2004

### **Appointments:**

Professor, Department of Physics, University of California, San Diego, 2015-present  
Co-Director, Joan & Irwin Jacobs Program in Astrophysics, 2013-Present  
Co-Director, Ax Center for Experimental Cosmology, 2011-present  
Associate Professor, Department of Physics, University of California, San Diego, 2009-2014  
Assistant Professor, Department of Physics, University of California, San Diego, 2004-2009

### **Awards and Honors:**

2016 Elected Fellow of the American Physical Society  
2015 UC San Diego Equal Opportunity/Affirmative Action & Diversity Award Winner  
2015 Nature News & Views Honorarium  
2014 Buckhalter Cosmology Prize, Second Place, \$5,000 prize winner  
2007 White House Presidential Early Career Award for Scientists & Engineers (PECASE)  
2006 UCSD Hellman Faculty Fellow  
2006 NSF Faculty Early Career Development Award (CAREER Program)  
2005 First Prize, Young Scholars Competition "Amazing Light" C. Townes Symposium  
2000-2004 NSF Astronomy & Astrophysics Postdoctoral Fellow  
1995-1999 NASA Graduate Student Research Fellow

### **Recent Publications:**

1. "The Oldest Cosmic Light", *Nature*, 518, 170–171, (2015)
2. "Detection of B-Mode Polarization at Degree Angular Scales by BICEP2", BICEP2 Collaboration, *Physical Review Letters*, Volume 112, Issue 24, id.241101 (2014) (arXiv:1403.3985)
3. "A Measurement of the Cosmic Microwave Background B-mode Polarization Power Spectrum at Sub-degree Scales with POLARBEAR", POLARBEAR Collaboration, *The Astrophysical Journal*, Volume 794, Issue 2, article id. 171, 21 pp. (2014) (arXiv:1403.2369)
4. "Evidence for Gravitational Lensing of the Cosmic Microwave Background Polarization from Cross-Correlation with the Cosmic Infrared Background", POLARBEAR Collaboration, *Physical Review Letters*, Volume 112, Issue 13, id.131302 (2014) (arXiv:1312.6645)
5. "Measurement of the Cosmic Microwave Background Polarization Lensing Power Spectrum with the POLARBEAR Experiment", POLARBEAR Collaboration, *Physical Review Letters*, Volume 113, Issue 2, id.021301 (2014) (arXiv:1312.6646)

**Other Publications:**

6. “*Reconstruction of Gravitational Lensing Using WMAP 7-Year Data*”, Feng, C., **Keating, B.**, Paar H., and Zahn O., Physical Review D, vol. 85, Issue 4, id. 043513 (2012) (arXiv: 1111.2371)
7. “*Self-calibration of Cosmic Microwave Background Polarization Experiments*”, **Keating, B.**, Shimon, M., and Yadav, A., Astrophysical Journal Letters, Vol. 762, Iss. 2, id. L23, 4 pp. (2013) (arXiv: 1211.5734)
8. “*Self-calibration of BICEP1 three-year data and constraints on astrophysical polarization rotation*”, Kaufman, J.P. et al., Physical Review D, Volume 89, Issue 6, id.062006 (2014) (arXiv:1312.7877)
9. “*Inflation physics from the cosmic microwave background and large scale structure*”, Abazajian, K.N. et al., Astroparticle Physics, Volume 63, p. 55-65. (2015) (arXiv:1309.5381)
10. “*Neutrino physics from the cosmic microwave background and large scale structure*”, Abazajian, K.N. et al., Astroparticle Physics, Volume 63, p. 66-80. (2015) (arXiv:1309.5383)

**Graduate & Postdoctoral Advisors:** Graduate advisor (1 total): Peter Timbie, (Brown), Post-doctoral advisors (2 total): Andrew Lange (Caltech) and Sarah Church (Stanford).

**Postdoctoral Advisees:** Current (3): Nathan Stebor, Grant Teply, Jonathan Kaufman. Former (5): Kam Arnold (Professor at UW Madison) Amit Yadav (industry), Tom Renbarger (Instructor at Foothill College), Meir Shimon (Adj. Faculty Tel Aviv), Angiola Orlando (Univ. Bologna, Italy).

**Graduate Advisees:** Current (8): Tucker Ellefot,, Lindsay Lowry, David Leon, Logan Howe, Alex, Zahn, Frederick Matsuda, Martin Navaroli, Praween Siritanasak. Former: (7) all in academia with fellowships or industry.

**Synergistic Activities:**

1. Outreach presentations to 3000+ Kindergarten-12th grade students (Since 1994).
2. Developed Radio telescope for education & Public Outreach (TRITON-Cam).
3. Board Member: Math for America, San Diego (2006-2014).
4. Board Member: San Diego Air & Space Museum (2013-Present).
5. Trustee of the National Museum of Mathematics (MoMath) (2014-2017).
6. Moorehouse UCSD Bridge Program: Summer Mentor (2015-2016)
7. Board Member: Angel Flight West (Volunteer Pilot Organization for need-based transport)

**Technology Transfer:**

United States Patent & Trademark Office Patent #7,501,909: Keating, B. and Lange, A., “***A Wide-Bandwidth Polarization Modulator for Microwave & MM-Wavelengths***” (2009)

## Collaborators & Affiliations:

Abazajian, K.N. (1); Ade, P.A.R. (2); Aiken, R. (3); Aikin, R.W. (4); Akiba, Y. (5); Aleman, C. (6); Amiri, M. (7); Anthony, A.E. (8); Arai, T. (9); Arnold, K. (6); Aslanyan, G. (6); Atlas, M. (6); Austermann, J. (10); Barkats, D. (11); Barron, D. (6); Battle, J.O. (12); Benson, B.A. (13); Benton, S.J. (14); Bierman, E.M. (15); Bischoff, C.A. (16); Bock, J.J. (4); Boettger, D. (6); Bond, J.R. (14); Borrill, J. (17); Borys, C. (3); Brevik, J.A. (3); Brown, S.W. (18); Buder, I. (13); Bullock, E. (19); Burke, D.L. (13); Calabrese, E. (20); Carlstrom, J.E. (13); Carvalho, C.S. (21); Chang, C.L. (13); Chapman, S. (22); Chiang, H.C. (13); Chinone, Y. (22); Church, S. (23); Cooray, A. (13); Crawford, T.M. (13); Crill, B.P. (13); Cukierman, A. (24); Culverhouse, T.L. (3); Das, S. (25); Davis, G. (7); Dawson, K.S. (26); Day, P.K. (27); De Bernardis, F. (1); Devlin, M.J. (28); Dobbs, M. (29); Dodelson, S. (30); Dore, O. (27); Dowell, C.D. (27); Duband, L. (31); Dunkley, J. (20); Dvorkin, I. (32); Edwards, J. (6); Elleflot, T. (6); Engargiola, G. (17); Errard, J. (33); Fabbian, G. (34); Feng, C. (6); Feng, G. (6); Feng, J.L. (13); Filippini, J.P. (4); Flanigan, D. (24); Fliescher, S. (19); Fraisse, A. (35); Friedland, A. (36); Fuller, G.M. (6); Gallicchio, J. (13); Ghribi, A. (24); Giddings, S.B. (13); Gilbert, A. (37); Golwala, S.R. (3); Grainger, W. (38); Green, D. (13); Halpern, M. (7); Halverson, N.W. (10); Hanany, S. (19); Hannestad, S. (39); Hanson, D. (13); Harrington, N. (24); Hasegawa, M. (40); Hasselfield, M. (7); Hattori, K. (40); Hazumi, M. (40); Hildebrandt, S.R. (3); Hilton, G.C. (18); Hincks, A. (7); Hivon, E.F. (41); Hlozek, R. (35); Holder, G. (37); Holzappel, W.L. (24); Honscheid, K. (42); Hori, Y. (40); Horowitz, G. (13); Howard, J. (40); Hristov, V.V. (3); Hu, W. (13); Hubmayr, J. (18); Hyland, P. (43); Inoue, Y. (5); Irwin, K. (23); Irwin, K.D. (18); Itzhaki, N. (32); Jackson, M. (13); Jaehnig, G.C. (8); Jaffe, A.H. (44); Jones, W.C. (35); Kallos, R. (13); Kamionkowski, M. (45); Karkare, K.S. (16); Katayama, N. (46); Kaufman, J.P. (6); Keisler, R. (13); Kermish, Z. (35); Kernasovskiy, S.S. (23); Kesitalo, R. (17); Kim, M. G. (47); Kinney, W. (13); Kisner, T. (17); Knox, S. (9); Komatsu, E. (49); Korngut, P.M. (27); Kovac, J.M. (16); Krantz, W. (10); Krayer, L. (6); Kuo, C.L. (23); Kusaka, A. (13); Lam, A.C. (3); Lange, A.E. (3); Lanz, A. (3); Lawrence, C. (27); Le Jeune, M. (50); Lee, A.T. (24); Lee, D.H. (51); Leitch, E.M. (52); Levenson, L.R. (3); Linde, A. (13); Linder, E.V. (17); Llombart, N. (27); Lowell, P. (18); Lubin, P. (53); Lueker, M. (3); Lunardini, C. (54); Lungu, M. (24); Lykke, K.R. (18); Maldacena, J. (13); Manohar, A.V. (6); Martinec, E. (13); Mason, P.V. (3); Matsuda, F. (6); Matsumoto, T. (9); Matsumura, T. (40); Matsuura, S. (9); McMahon, J. (55); Melchiorri, A. (56); Meng, X.F. (24); Miller, A. (57); Miller, N.J. (58); Miquel, R. (59); Mitchell-Wynne, K. (1); Morii, H. (40); Moyerman, S.M. (6); Mukhanov, V. (13); Murata, K. (9); Myers, M.J. (24); Nam, U.W. (51); Navaroli, M. (6); Netterfield, C.B. (14); Newburgh, L. (35); Nguyen, H. T. (60); Niemack, M.D. (61); Nishino, H. (46); O'Brien, R. (3); Ogburn, R.W. (62); Okamura, T. (40); Orlando, A. (6); Paar, H.P. (6); Page, L. (35); Peloton, J. (50); Pierpaoli, E. (63); Poletti, D. (50); Ponthieu, N. (64); Pritchard, J. (16); Pryke, C. (19); Quealy, E. (24); Rebeiz, G. (6); Reichardt, C.L. (65); Reintsema, C.D. (18); Renbarger, T. (6); Rephaeli, Y. (32); Richards, P.L. (24); Richter, S. (3); Rocha, G.M. (4); Rosen, D. (24); Ross, C. (22); Rotermund, K. (22); Ruhl, J. E. (66); Schanning, I. (6); Schenck, D.E. (10); Schwarz, R. (19); Sehgal, N. (67); Seljak, U. (42); Senatore, L. (13); Serra, P. (58); Sheehy, C. (13); Sheehy, C.D. (19); Sherwin, B.D. (24); Shimizu, A. (5); Shimmin, C. (5); Shimon, M. (68); Sholl, M. (17); Shultz, B. (69); Sievers, J. (70); Silverstein, E. (23); Siritanasak, P. (6); Slosar, A. (71); Smecher, G. (72); Smidt, J. (1); Smith, A.W. (18); Smith, K.M. (73); Spergel, D. (35); Spieler, H. (17); Staggs, S.T. (35); Staniszewski, Z.K. (3); Stark, A. (16); Stebor, N. (6); Steinbach, B. (24); Stompor, R. (13); Story, K.T. (13); Su, M. (74); Sudiwala, R.V. (2); Sullivan, I. (75); Suzuki, A. (24); Suzuki, J. (40); Suzuki, K. (76); Takada, M. (77); Takada, S. (78); Takahashi, Y.D. (24); Takakura, S. (50); Teplý, G.P. (3); Tikhomirov, A. (50); Tolan, J.E. (23); Tomaru, T. (40); Tsumura, K. (9); Tucker, C. (2); Turner, A.D. (27); Ullom, J. (18); Vieregge, A.G. (13); Wada, T. (9); Walker, W. (79); Wang, G. (25); Watson, S. (80); Wilson, B. (6); Wilson, P. (27); Wollack, E.J. (58); Wong, C.L. (16); Wong, Y.Y.Y. (81); Wu, W. L. K. (23); Yadav, A.P.S. (82); Yamaguchi, H. (40); Yoon, K.W. (23); Zahn, O. (24); Zaldarriaga, M. (13); Zemcov, M. (27); de Haan, T. (37)

1=UC Irvine, 2=Cardiff, 3=Caltech, 4=MIT/Caltech, 5=Hayama, 6=UCSD, 7=UBC, 8=Colorado/Hayama, 9=ISAS, 10=Colorado, 11=ESO, 12=JPL/Caltech, 13=Chicago, 14=Toronto, 15=MIT/UCSD, 16=CfA, 17=LBNL, 18=NIST, 19=Minnesota, 20=Oxford, 21=Lisboa, 22=Dalhousie, 23=Stanford, 24=Berkeley, 25=Argonne, 26=Utah, 27=JPL, 28=UPenn, 29=Chicago/McGill, 30=Fermilab, 31=SBT, 32=Tel Aviv, 33=SSL, 34=APC, 35=Princeton, 36=LANL, 37=McGill, 38=STFC, 39=Aarhus, 40=KEK, 41=Paris, 42=Ohio State, 43=Austin College, 44=Imperial, 45=JHU, 46=KIPMU, 47=Seoul, 48=UC Davis, 49=Max-Planck, 50=Osaka, 51=KASI, 52=Chicago/Osaka, 53=UCSB, 54=ASU, 55=Michigan, 56=INFN, 57=Columbia, 58=NASA, 59=Barcelona, 60=Fermilab/Chicago, 61=Cornell, 62=Stanford/JPL, 63=USC, 64=MIT, 65=Ohio State/Berkeley, 66=Case Western, 67=Stony Brook, 68=UCSD/Tel Aviv, 69=Materion Barr, 70=CITA, 71=Brookhaven, 72=Three-Speed Logic, 73=Perimeter, 74=MIT/CfA, 75=Washington, 76=Nagoya, 77=KIMPU, 78=NIFS, 79=?, 80=Syracuse, 81=RWTH, 82=UCSD/CfA