Fermi LAT Collaboration

A. A. Abdo[1,2], M. Abry[3], M. Ackermann[4], M. Ajello[4], Y. Akrami[5,6], A. Allafort[4], B. Anderson[7], E. Antolini[8,9], K. Asano[10], W. B. Atwood[7], T. Aune[7], M. Axelsson[5,11], M. Balbo[12,13], L. Baldini[14], J. Ballet[15], E. A. Baltz[4,16], D. L. Band[17,18,19], G. Barbiellini[20,21], M. G. Baring[22], D. Bastieri[12,13], M. Battelino[5,23], B. M. Baughman[24], K. Bechtol[4], A. Belfiore[25], R. Bellazzini[14], B. Berenji[4], L. Bergström[5,6], D. Bernard[26], G. F. Bignami[27], E. Bissaldi[28], R. D. Blandford[4], P. Blasi[29], E. D. Bloom[4], M. Boeck[30], E. Bonamente[8,9], J. Bonnell[19], A. W. Borgland[4], A. Bouvier[4], T. J. Brandt[24], J. Bregeon[14], A. Brez[14], M. Brigida[31,32], P. Bruel[26], T. H. Burnett[33], G. Busetto[12,13], S. Buson[13], G. A. Caliandro[31,32], R. A. Cameron[4], B. Canadas[34,35], A. Cannon[19,36], P. A. Caraveo[25], S. Carius[37], P. Carlson[5,23], S. Carrigan[13], J. M. Casandjian[15], E. Cavazzuti[38], C. Cecchi[8,9], Ö. Çelik[19], A. Celotti[39], C. S. Chang[40], E. Charles[4], S. Chaty[15], A. Chekhtman[2,41], A. W. Chen[25], C. C. Cheung[19], J. Chiang[4], A. N. Cillis[19], S. Ciprini[8,9], R. Claus[4], I. Cognard[42], J. Cohen-Tanugi[3], S. Colafrancesco[38], W. Collmar[28], L. R. Cominsky[43], V. Connaughton[44], J. Conrad[5,6,23,45], S. Corbel[15], R. Corbet[19,46], L. Costamante[4], S. Cutini[38], N. D'Amico[47], T. M. Dame[48], D. S. Davis[19,46], M. DeCesar[19,49], P. den Hartog[4], H. Dereli[13], C. D. Dermer[2], G. Desvignes[50], A. de Angelis[51], A. de Luca[27], F. de Palma[31,32], A. De Rosa[52], A. Dhanji[4], S. W. Digel[4], B. L. Dingus[53], G. Di Bernardo[14], D. Donato[19], M. Dormody[7], E. do Couto e Silva[4], P. S. Drell[4], R. Dubois[4], G. Dubus[54], D. Dumora[55,56], M. S. Dutka[57], Y. Edmonds[4], J. Edsjö[5,6], S. Ehlert[4], M. Enein[33], T. Ergin[48], C. Farnier[3], C. Favuzzi[31,32], S. J. Fegan[26], E. C. Ferrara[19], J. Finke[1,2], P. Fleury[26], W. B. Focke[4], P. Fortin[26], L. Foschini[58], M. Frailis[51], L. Fuhrmann[40], Y. Fukazawa[59], Y. Fukui[60], S. Funk[4], A. K. Furniss[7], P. Fusco[31,32], D. Gaggero[14], A. Galli[52], F. Gargano[32], D. Gasparrini[38], N. Gehrels[19,49], M. Georganopoulos[46], S. Germani[8,9], R. Giannitrapani[51], G. Giavitto[61], B. Giebels[26], N. Giglietto[31,32], P. Giommi[38], F. Giordano[31,32], M. Giroletti[62], T. Glanzman[4], G. Godfrey[4], S. Gradari[21], P. Grandi[63], J. Granot[64], D. Grasso[14], I. A. Grenier[15], M.-H. Grondin[55,56], J. E. Grove[2], L. Guillemot[55,56], S. Guiriec[44], M. Gustafsson[12,13], C. Gwon[2], D. Hadasch[65], Y. Hanabata[59], A. K. Harding[19], R. C. Hartman[19], K. Hayashi[59], M. Hayashida[4], E. Hays[19], S. E. Healey[4], G. Henri[54], A. B. Hill[54], M. Hirayama[19,46], L. Hjalmarsdotter[5,11], D. Horan[26], R. E. Hughes[24], S. D. Hunter[19], G. Iafrate[20,66], R. C .Gilmore[7], D. Impiobato[8,9], S. Ishikawa[67], R. Itoh[59], M. S. Jackson[6], P. Jean[68], T. E. Jeltema[69], G. Jóhannesson[4], A. S. Johnson[4], R. P. Johnson[7], T. J. Johnson[19,49], W. N. Johnson[2], S. Johnston[70], M. Kadler[17,30,71,72], T. Kamae[4], Y. Kanai[73], G. Kanbach[28], H. Katagiri[59], J. Kataoka[74], J. Katsuta[67,75], N. Kawai[73,76], M. Kerr[33], T. Kishishita[67], B. Kızıltan[69], J. Knödlseder[68], D. Kocevski[4], M. L. Kocian[4], E. Koerding[15], N. Komin[3,15], M. Kramer[77], F. Kuehn[24], M. Kuss[14], J. Lande[4], S. Larsson[5,6], L. Latronico[14], S.-H. Lee[4], M. Lemoine-Goumard[55,56], T. Linden[7], A. M. Lionetto[34,35], M. Llena Garde[5,6], F. Longo[20,21], F. Loparco[31,32], B. Lott[55,56], M. N. Lovellette[2], P. Lubrano[8,9], G. M. Madejski[4], A. Makeev[2,41], K. Makishima[75], G. Malaguti[63], O. Mansutti[51], M. Marelli[25], P. Martin[28], M. M. Massai[14], E. Massaro[78], W. Max-Moerbeck[79], M. N. Mazziotta[32], W. McConville[19,49], J. E. McEnery[19], S. McGlynn[5,23], P. Mészáros[80], C. Meurer[5,6], P. F. Michelson[4], R. P. Mignani[81], T. Mineo[82], W. Mitthumsiri[4], T. Mizuno[59], A. A. Moiseev[17,49], C. Monte[31,32], M. E. Monzani[4], E. Moretti[20,21], Y. Mori[73], M. Morii[73], A. Morselli[34], I. V. Moskalenko[4], S. Murgia[4], R. Murphy[2], C. Müller[30], H. Nakajima[73], T. Nakamori[73], G. Navarro[13], I. Nestoras[40], S. Nishino[59], P. L. Nolan[4], J. P. Norris[83], E. Nuss[3], H. Odaka[67], M. Ohno[67], T. Ohsugi[59], R. Ojha[84], A. Okumura[75], M. Olivo[20], N. Omodei[14], R. A. Ong[85], E. Orlando[28], J. F. Ormes[83], A. N. Otte[7], M. Ozaki[67], B. Pancrazi[68], D. Paneque[4], J. H. Panetta[4], D. Parent[55,56], V. Pavlidou[79], T. J. Pearson[79], V. Pelassa[3], G. Pelletier[54], M. Pepe[8,9], M. Pesce-Rollins[14], V. Petrosian[4], G. Piano[34,35], P. Picozza[34,35], M. Pierbattista[15], S. Piranomonte[86], F. Piron[3], C. Pittori[38], A. Pohl[37], M. Pohl[87], T. A. Porter[7], M. Prest[20,88], J. R. Primack[7], S. Profumo[7], S. Rainò[31,32], E. Ramirez-Ruiz[69], R. Rando[12,13], P. S. Ray[2], M. Razzano[14], S. Razzaque[1,2], N. Rea[89,90], A. Readhead[79], A. Reimer[4], O. Reimer[4,91], T. Reposeur[55,56], L. C. Reyes[92], J. L. Richards[79],

J. Ripken[5,6], S. Ritz[19], S. Robinson[33,93], L. S. Rochester[4], A. Y. Rodriguez[90], R. W. Romani[4], M. Roth[33], J. J. Russell[4], F. Ryde[5,23], S. Sabatini[34,35], T. Sada[59], H. F.-W. Sadrozinski[7], A. Saggion[12,13], R. Sambruna[19], D. Sanchez[26], A. Sander[24], R. Sato[67], P. M. Saz Parkinson[7], J. D. Scargle[94], T. L. Schalk[7], J. Schmitt[15], P. Scott[5,6], A. Sellerholm[5,6], C. Sgrò[14], G. H. Share[2,95], M. S. Shaw[4], C. Shrader[17], J. Siegal-Gaskins[24], A. Sierpowska-Bartosik[90], E. J. Siskind[96], D. M. Smith[7], D. A. Smith[55,56], P. D. Smith[24], K. Sokolovsky[40], G. Spandre[14], P. Spinelli[31,32], M. Stamatikos[19], J.-L. Starck[15], F. W. Stecker[19], T. E. Stephens[72,94], M. Stevenson[79], E. Striani[34,35], M. S. Strickman[2], A. W. Strong[28], S. Sugimoto[67], M. Sugizaki[4], D. J. Suson[97], G. Tagliaferri[58], H. Tajima[4], H. Takahashi[59], T. Takahashi[67], S. Takeda[67], T. Tanaka[4], Y. Tanaka[67], M. Tavani[52], G. B. Taylor[98], J. B. Thayer[4], J. G. Thayer[4], G. Theureau[42], D. J. Thompson[19], S. E. Thorsett[7], L. Tibaldo[12,13], O. Tibolla[99], M. Tinivella[14], K. Toma[80], D. F. Torres[65,90], G. Tosti[8,9], A. Tramacere[4,100], P. Ubertini[52], Y. Uchiyama[4], T. Uehara[59], P. Ullio[39], J. Ulvestad[101], T. L. Usher[4], M. Ushio[67], A. Van Etten[4], V. Vasileiou[17,46], C. Venter[19,102], N. Vilchez[68], M. Villata[103], V. Vitale[34,35], A. P. Waite[4], E. Wallace[33], P. Wang[4], K. Watters[4], N. Webb[68], A. E. Wehrle[104], D. A. Williams[7], B. L. Winer[24], E. Winter[19], M. T. Wolff[2], K. S. Wood[2], S. E. Woosley[69], X. F. Wu[80,105,106], R. Yamazaki[59], H. Yasuda[59], Y. Yatsu[73], T. Ylinen[5,23,37], T. Yuasa[75], G. Zaharijas[5,6], S. Zalewski[7], J. A. Zensus[40], M. Ziegler[7]

[1]National Research Council Research Associate, National Academy of Sciences, Washington, DC 20001, USA
[2]Space Science Division, Naval Research Laboratory, Washington, DC 20375, USA
[3]Laboratoire de Physique Théorique et Astroparticules, Université Montpellier 2, CNRS/IN2P3, Montpellier, France
[4]W. W. Hansen Experimental Physics Laboratory, Kavli Institute for Particle Astrophysics and Cosmology, Department of Physics and SLAC National Accelerator Laboratory, Stanford University, Stanford, CA 94305, USA
[5]The Oskar Klein Centre for Cosmo Particle Physics, AlbaNova, SE-106 91 Stockholm, Sweden
[6]Department of Physics, Stockholm University, AlbaNova, SE-106 91 Stockholm, Sweden
[7]Santa Cruz Institute for Particle Physics, Department of Physics and Department of Astronomy and Astrophysics, University of California at Santa Cruz, Santa Cruz, CA 95064, USA
[8]Istituto Nazionale di Fisica Nucleare, Sezione di Perugia, I-06123 Perugia, Italy
[9]Dipartimento di Fisica, Università degli Studi di Perugia, I-06123 Perugia, Italy
[10]Interactive Research Center of Science, Tokyo Institute of Technology, Meguro City, Tokyo 152-8551, Japan
[11]Department of Astronomy, Stockholm University, SE-106 91 Stockholm, Sweden
[12]Istituto Nazionale di Fisica Nucleare, Sezione di Padova, I-35131 Padova, Italy
[13]Dipartimento di Fisica "G. Galilei", Università di Padova, I-35131 Padova, Italy
[14]Istituto Nazionale di Fisica Nucleare, Sezione di Pisa, I-56127 Pisa, Italy
[15]Laboratoire AIM, CEA-IRFU/CNRS/Université Paris Diderot, Service d'Astrophysique, CEA Saclay, 91191 Gif sur Yvette, France
[16]Google Inc., 1600 Amphitheatre Parkway, Mountain View, CA 94043, USA
[17]Center for Research and Exploration in Space Science and Technology (CRESST), NASA Goddard Space Flight Center, Greenbelt, MD 20771, USA
[18]Deceased
[19]NASA Goddard Space Flight Center, Greenbelt, MD 20771, USA
[20]Istituto Nazionale di Fisica Nucleare, Sezione di Trieste, I-34127 Trieste, Italy
[21]Dipartimento di Fisica, Università di Trieste, I-34127 Trieste, Italy
[22]Rice University, Department of Physics and Astronomy, MS-108, P. O. Box 1892, Houston, TX 77251, USA
[23]Department of Physics, Royal Institute of Technology (KTH), AlbaNova, SE-106 91 Stockholm, Sweden
[24]Department of Physics, Center for Cosmology and Astro-Particle Physics, The Ohio State University, Columbus, OH 43210, USA
[25]INAF-Istituto di Astrofisica Spaziale e Fisica Cosmica, I-20133 Milano, Italy
[26]Laboratoire Leprince-Ringuet, École polytechnique, CNRS/IN2P3, Palaiseau, France
[27]Istituto Universitario di Studi Superiori (IUSS), I-27100 Pavia, Italy
[28]Max-Planck Institut für extraterrestrische Physik, 85748 Garching, Germany
[29]Osservatorio Astrofisico di Arcetri, 50125 Firenze, Italy
[30]Dr. Remeis-Sternwarte Bamberg, Sternwartstrasse 7, D-96049 Bamberg, Germany
[31]Dipartimento di Fisica "M. Merlin" dell'Università e del Politecnico di Bari, I-70126 Bari, Italy
[32]Istituto Nazionale di Fisica Nucleare, Sezione di Bari, 70126 Bari, Italy

[33]*Department of Physics, University of Washington, Seattle, WA 98195-1560, USA*
[34]*Istituto Nazionale di Fisica Nucleare, Sezione di Roma "Tor Vergata", I-00133 Roma, Italy*
[35]*Dipartimento di Fisica, Università di Roma "Tor Vergata", I-00133 Roma, Italy*
[36]*University College Dublin, Belfield, Dublin 4, Ireland*
[37]*School of Pure and Applied Natural Sciences, University of Kalmar, SE-391 82 Kalmar, Sweden*
[38]*Agenzia Spaziale Italiana (ASI) Science Data Center, I-00044 Frascati (Roma), Italy*
[39]*Scuola Internazionale Superiore di Studi Avanzati (SISSA), 34014 Trieste, Italy*
[40]*Max-Planck-Institut für Radioastronomie, Auf dem Hügel 69, 53121 Bonn, Germany*
[41]*George Mason University, Fairfax, VA 22030, USA*
[42]*Laboratoire de Physique et Chemie de l'Environnement, LPCE UMR 6115 CNRS, F-45071 Orléans Cedex 02, and Station de radioastronomie de Nançay, Observatoire de Paris, CNRS/INSU, F-18330 Nançay, France*
[43]*Department of Physics and Astronomy, Sonoma State University, Rohnert Park, CA 94928-3609, USA*
[44]*University of Alabama in Huntsville, Huntsville, AL 35899, USA*
[45]*Royal Swedish Academy of Sciences Research Fellow, funded by a grant from the K. A. Wallenberg Foundation*
[46]*University of Maryland, Baltimore County, Baltimore, MD 21250, USA*
[47]*INAF - Cagliari Astronomical Observatory, I-09012 Capoterra (CA), Italy*
[48]*Harvard-Smithsonian Center for Astrophysics, Cambridge, MA 02138, USA*
[49]*University of Maryland, College Park, MD 20742, USA*
[50]*Laboratoire de Physique et Chemie de l'Environnement, LPCE UMR 6115 CNRS, F-45071 Orléans Cedex 02, France*
[51]*Dipartimento di Fisica, Università di Udine and Istituto Nazionale di Fisica Nucleare, Sezione di Trieste, Gruppo Collegato di Udine, I-33100 Udine, Italy*
[52]*INAF-Istituto di Astrofisica Spaziale e Fisica Cosmica, I-00133 Roma, Italy*
[53]*Los Alamos National Laboratory, Los Alamos, NM 87545, USA*
[54]*Observatoire de Sciences de l'Univers, Université Joseph Fourier, BP 53, 38041 Grenoble CEDEX 9, France*
[55]*CNRS/IN2P3, Centre d'Études Nucléaires Bordeaux Gradignan, UMR 5797, Gradignan, 33175, France*
[56]*Université de Bordeaux, Centre d'Études Nucléaires Bordeaux Gradignan, UMR 5797, Gradignan, 33175, France*
[57]*Catholic University of America, Washington, DC 20064, USA*
[58]*INAF Osservatorio Astronomico di Brera, I-23807 Merate, Italy*
[59]*Department of Physical Sciences, Hiroshima University, Higashi-Hiroshima, Hiroshima 739-8526, Japan*
[60]*Nagoya University, Department of Physics and Astrophysics, Chikusa-ku Nagoya 464-8602, Japan*
[61]*Istituto Nazionale di Fisica Nucleare, Sezione di Trieste, and Università di Trieste, I-34127 Trieste, Italy*
[62]*INAF Istituto di Radioastronomia, 40129 Bologna, Italy*
[63]*INAF-IASF Bologna, 40129 Bologna, Italy*
[64]*Centre for Astrophysics Research, University of Hertfordshire, College Lane, Hatfield AL10 9AB , UK*
[65]*Institució Catalana de Recerca i Estudis Avançats, Barcelona, Spain*
[66]*Osservatorio Astronomico di Trieste, Istituto Nazionale di Astrofisica, I-34143 Trieste, Italy*
[67]*Institute of Space and Astronautical Science, JAXA, 3-1-1 Yoshinodai, Sagamihara, Kanagawa 229-8510, Japan*
[68]*Centre d'Étude Spatiale des Rayonnements, CNRS/UPS, BP 44346, F-30128 Toulouse Cedex 4, France*
[69]*UCO/Lick Observatories, Santa Cruz, CA 95064, USA*
[70]*Australia Telescope National Facility, CSIRO, Epping NSW 1710, Australia*
[71]*Erlangen Centre for Astroparticle Physics, D-91058 Erlangen, Germany*
[72]*Universities Space Research Association (USRA), Columbia, MD 21044, USA*
[73]*Department of Physics, Tokyo Institute of Technology, Meguro City, Tokyo 152-8551, Japan*
[74]*Waseda University, 1-104 Totsukamachi, Shinjuku-ku, Tokyo, 169-8050, Japan*
[75]*Department of Physics, Graduate School of Science, University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, Tokyo 113-0033, Japan*
[76]*Cosmic Radiation Laboratory, Institute of Physical and Chemical Research (RIKEN), Wako, Saitama 351-0198, Japan*
[77]*Jodrell Bank Centre for Astrophysics, School of Physics and Astronomy, The University of Manchester, M13 9PL, UK*
[78]*Università di Roma "La Sapienza", I-00185 Roma, Italy*
[79]*California Institute of Technology, Pasadena, CA 91125, USA*
[80]*Department of Astronomy and Astrophysics, Pennsylvania State University, University Park, PA 16802, USA*
[81]*Mullard Space Science Laboratory, Holmbury St. Mary, Dorking, Surrey, RH5 6NT, UK*
[82]*IASF Palermo, 90146 Palermo, Italy*
[83]*Department of Physics and Astronomy, University of Denver, Denver, CO 80208, USA*

[84] *U. S. Naval Observatory, 2450 Massachusetts Avenue NW, Washington, DC 20392, USA*
[85] *University of California, Department of Physics and Astronomy, 430 Portola Plaza, Los Angeles, CA 90095-1547, USA*
[86] *Osservatorio Astronomico di Roma, 00040 Monte Porzio Catone, Italy*
[87] *Iowa State University, Department of Physics and Astronomy, Ames, IA 50011-3160, USA*
[88] *Dipartimento di Fisica e Matematica, Università dell'Insubria, I-22100 Como, Italy*
[89] *Sterrenkundig Institut "Anton Pannekoek", 1098 SJ Amsterdam, Netherlands*
[90] *Institut de Ciencies de l'Espai (IEEC-CSIC), Campus UAB, 08193 Barcelona, Spain*
[91] *Institut für Astro- und Teilchenphysik, Leopold-Franzens-Universität Innsbruck, A-6020 Innsbruck, Austria*
[92] *Kavli Institute for Cosmological Physics, University of Chicago, Chicago, IL 60637, USA*
[93] *Pacific Northwest National Laboratory, Richland, WA 99352, USA*
[94] *Space Sciences Division, NASA Ames Research Center, Moffett Field, CA 94035-1000, USA*
[95] *Praxis Inc., Alexandria, VA 22303, USA*
[96] *NYCB Real-Time Computing Inc., Lattingtown, NY 11560-1025, USA*
[97] *Department of Chemistry and Physics, Purdue University Calumet, Hammond, IN 46323-2094, USA*
[98] *University of New Mexico, MSC07 4220, Albuquerque, NM 87131, USA*
[99] *Max-Planck-Institut für Kernphysik, D-69029 Heidelberg, Germany*
[100] *Consorzio Interuniversitario per la Fisica Spaziale (CIFS), I-10133 Torino, Italy*
[101] *National Radio Astronomy Observatory (NRAO), Charlottesville, VA 22903, USA*
[102] *Unit for Space Physics, North-West University, Potchefstroom Campus, Private Bag X6001, Potchefstroom 2520, South Africa*
[103] *INAF, Osservatorio Astronomico di Torino, I-10025 Pino Torinese (TO), Italy*
[104] *Space Science Institute, Boulder, CO 80301, USA*
[105] *Joint Center for Particle Nuclear Physics and Cosmology (J-CPNPC), Nanjing 210093, China*
[106] *Purple Mountain Observatory, Chinese Academy of Sciences, Nanjing 210008, China*