

Coll 1: ALPS-Collaboration

TODD KOZLOWSKI¹, LI-WEI WEI², AARON SPECTOR¹, AYMAN HALLAL², HENRY FRAEDRICH¹, DANIEL BROTHERTON⁵, ISABELLA OCEANO¹, ALDO EJLLI^{2,3}, HARTMUT GROTE⁴, HAROLD HOLLIS⁵, KANIOAR KARAN², GUIDO MUELLER^{2,3,5}, DAVID TANNER⁵, BENNO WILLKE^{2,3}, AXEL LINDNER¹, FRIEDERIKE JANUSCHER¹, JOSE RUBIERA GIMENO¹, CHRISTINA SCHWEMMBAUER¹, and UWE SCHNEEKLOTH¹ — ¹Deutsches Elektronen-Synchrotron DESY — ²Albert-Einstein-Institut — ³Leibniz University Hannover — ⁴Cardiff University — ⁵University of Florida

Coll 2: ANNIE-Collaboration

AMALA AUGUSTHY¹, MARVIN ASCENCIO-SOSA², JOHN BEACOM³, MARC BERGEVIN⁴, DANIEL BICK⁵, MARC BREISCH⁶, GIAN CACERES VERA⁷, LORENZO CASATA⁶, STEVEN DAZELEY⁴, STEVEN DORAN², EVANGELIA DRAKOPOULOU⁸, SIJITH EDAYATH², RORY EDWARDS⁹, JONATHAN EISCH¹⁰, YUE FENG², VINCENT FISCHER¹⁰, ROB FOSTER¹¹, STEVEN GARDINER¹⁰, NOAH GOEHLKE¹, PAUL HACKSPACHER⁷, CAREN HAGNER⁵, JULIE HE⁷, BENEDICT KAISER⁶, PHILIPP KERN¹, FRANK KRENNRICH², TOBIAS LACHENMAIER⁶, FRANKLIN LEMMONS¹², DAVID MAKSIMOVIC¹, MATTHEW MALEK¹¹, JOHANN MARTYN¹, ANDREW MASTBAUM¹², CARRIE MCGIVERN¹⁰, JAMES MINOCK¹³, MARCUS O'FLAHERTY⁹, TEAL PERSHING⁴, NAVANEETH POONTHOTTATHIL¹⁴, BEN RICHARDS⁹, MAYLY SANCHEZ¹⁵, DANIEL TOBIAS SCHMID¹, MICHAEL SMY¹⁶, MALTE STENDER⁵, ANDREW SUTTON¹⁵, HANS STEIGER¹⁷, ROBERT SVOBODA⁷, EMRAH TIRAS^{18,19}, MARK VAGINS¹⁶, VENKATESH VEERARAGHAVAN², JINGBO WANG¹², AMANDA WEINSTEIN², MATTHEW WETSTEIN², MICHEL WURM¹, TIANQI ZHANG⁷, and DORINA CAROLIN ZUNDEL¹ — ¹Johannes Gutenberg-Universität, Institut für Physik, Mainz 55128, Germany — ²Iowa State University, Department of Physics and Astronomy, Ames, IA 50011 U.S.A. — ³Ohio State University, Department of Physics, Columbus, OH 43210 U.S.A. — ⁴Lawrence Livermore National Laboratory, Livermore, CA 94550 U.S.A. — ⁵Universität Hamburg, Institut für Experimentalphysik, Hamburg 22761, Germany — ⁶Eberhard Karls Universität, Kepler Center for Astro and Particle Physics, Tübingen 72076, Germany — ⁷University of California at Davis, Department of Physics and Astronomy, Davis, CA 95616, U.S.A. — ⁸N.C.S.R. "Demokritos", Institute of Nuclear and Particle Physics, Agia Paraskevi 15341, Greece — ⁹University of Warwick, Department of Physics, Coventry CV47AL U.K. — ¹⁰Fermi National Accelerator Laboratory, Batavia, IL 60510, U.S.A. — ¹¹University of Sheffield, Department of Physics and Astronomy, Sheffield, S10 2TN, U.K. — ¹²South Dakota School of Mines and Technology, Physics Department, Rapid City SD, 57701 U.S.A. — ¹³Rutgers University, Department of Physics and Astronomy, Piscataway, NJ 08854 U.S.A. — ¹⁴Indian Institute of Technology Kanpur, Department of Physics, Kanpur 208016, India — ¹⁵Florida State University, Department of Physics, Tallahassee, FL 32306 U.S.A. — ¹⁶University of California at Irvine, Department of Physics and Astronomy, Irvine CA, 92697 U.S.A. — ¹⁷Technische Universität München, Physik-Department, Garching 85748, Germany — ¹⁸Erciyes University, Department of Physics, Kayseri, 38030, Türkiye — ¹⁹University of Iowa, Department of Physics and Astronomy, Iowa City, IA 52242 U.S.A.

Coll 3: APOSSON-Collaboration

MARTIN HILCHENBACH¹, THORSTEN KLEINE¹, OLIVER STENZEL¹, CHRISTIAN RENGGLI¹, ANDREAS NATHUES¹, NORTBERT KRUPP¹, HENNING FISCHER¹, ALEXANDER LOOSE¹, ECKHARD STEINMETZ¹, PHILIPP HEUMÜLLER¹, MONA WEDEMEIER¹, JENS BIELE², STEPHAN ULAMEC², JAN THIMO GRUNDMANN³, TRA-MI HO³, CARSTEN GÜTTLER⁴, BASTIAN GUNDLACH⁴, MORITZ GOLDMANN⁴, MARKUS PATZEK⁴, NICOLE SCHMITZ⁵, NIKLAS AKSTEINER³, SUDITI CHAND⁶, CLAUDIO CIANO⁹, FELIX EICHSTAEDT³, DENNIS ELLER⁹, OLAF ESSMANN³, HANNAH CHARLOTTE FEILER³, THOMAS FIRCHAU³, SEBASTIAN FEXER³, ALI GÜLHAN⁸, DOMINIK NEEB⁸, NIKLAS WENDEL⁸, PAWEL GOLDYN⁸, MORITZ HERBERHOLD³, VICTOR HERNANDEZ MEGIA³, CHRISTOPH KIRCHHEFER³, HANNAH KIRSTEIN³, EUGEN KSENIK³, MICHAEL LANGE⁷, PASCAL MARQUARDT⁸, FALK NOHKA³, OLIVER ROMBERG³, FELIX CONSTANTIN PASSENBERG³, DOMINIK QUANTIUS³, ANTON SCHNEIDER³, RENE SCHULZ³, FABIENNE MONIQUE SEIBERT³, MARTIN SIEMER³, STEPHAN THEIL³, GEORGIOS TSAKYRIDIS³, JEAN-BAPTISTE VINCENT⁵, TORBEN WIPPERMANN³, LARS WITTE³, MARCUS HALLMANN³, and LIVIA IONESCU³ — ¹Max-Planck-Institute for Solar System Research, Göttingen, Germany — ²Deutsches Zentrum für Luft- und Raumfahrt (DLR-MUSC), Cologne, Germany — ³Institute of Space Systems (DLR), Bremen, Germany — ⁴Universität Münster, Institut für Planetologie, Münster, Germany —

⁵DLR Institute of Planetary Research, Berlin, Germany — ⁶DLR Institute for Satellite Geodesy and Inertial Sensing, Bremen, Germany — ⁷DLR Institute of Lightweight Systems, Brunswick, Germany — ⁸DLR Institute of Aerodynamics and Flow Technology, Cologne, Germany — ⁹DLR Institute of Software Technology, Brunswick, Germany

Coll 4: Atomic Tritium at TLK-Collaboration

BEATE BORNSCHEIN, DAVID FRESE, TOBIAS GEIER, ROBIN GRÖSSLE, FLORIAN HANSS, LEONARD HASSELMANN, DAVID HILLESHEIMER, SEBASTIAN KOCH, DANIEL KURZ, ELIAS LÜTKENHORST, ALEXANDER MARSTELLER, FLORIAN PRIESTER, CAROLINE RODENBECK, MARCO RÖLLIG, MAGNUS SCHLÖSSER, MICHAEL STURM, THOMAS THÜMMELER, NANCY TUCHSCHERER, STEFAN WELTE, TOBIAS WEBER, and TOBIAS FALKE — Karlsruher Institut für Technologie

Coll 5: CMOS Strips Collaboration-Collaboration

JAN-HENDRIK ARLING¹, MARTA BASELGA², NAOMI DAVIS¹, LEENA DIEHL³, JOCHEN DINGFELDER⁴, INGRID-MARIA GREGOR¹, MARC HAUSER⁵, FABIAN HÜGGING⁴, KARL JAKOBS⁵, MICHAEL KARAGOUNIS⁶, ROLAND KOPPHÖFER⁵, KEVIN KRÖNINGER², FABIAN LEX⁵, ULRICH PARZEFALL⁵, BIRKAN SARI², NIELS SORGENFREI³, SIMON SPANNAGEL¹, DENNIS SPERLICH⁵, JENS WEINGARTEN², and IVETA ZATOCILOVA⁵ — ¹DESY, Hamburg, Germany — ²TU Dortmund, Dortmund, Germany — ³CERN, Genf, Schweiz — ⁴Universität Bonn, Bonn, Germany — ⁵Albert-Ludwigs-Universität Freiburg, Freiburg, Germany — ⁶FH Dortmund, Dortmund, Germany

Coll 6: CONUS-Collaboration

NICOLA ACKERMANN¹, HANNES BONET¹, CHRISTIAN BUCK¹, JANINE HEMPLING¹, GERD HEUSSER¹, MANFRED LINDNER¹, WERNER MANESCHG¹, KAI XIANG NI¹, THOMAS RINK¹, EDGAR SANCHEZ GARCIA¹, HERBERT STRECKER¹, and JANINA HAKENMÜLLER² — ¹Max-Planck-Institut für Kernphysik, Saupfercheckweg 1, 69117 Heidelberg — ²Duke University, Durham, NC 27706, United States

Coll 7: CORSIKA8-Collaboration

JEAN-MARCO ALAMEDDINE^{1,2}, JOHANNES ALBRECHT^{1,2}, JUAN AMMERMAN-YEBRA³, LUISA ARRABITO⁴, ANTONIO AUGUSTO ALVES JR^{5,6}, DOMINIK BAACK^{1,2}, ALAN COLEMAN⁷, HANS DEMBINSKI^{1,2}, DOMINIK ELSÄSSER^{1,2}, RALPH ENGEL⁵, ALICE FAURE⁴, ALFREDO FERRARI⁵, CHLOE GAUDU⁸, CHRISTIAN GLASER⁷, MARVIN GOTTOWIK⁵, DIETER HECK⁵, TIM HUEGE^{5,9}, KARL-HEINZ KAMPERT⁸, NIKOLAOS KARASTATHIS⁵, LUKAS NELLEN¹⁰, TANGUY PIEROG⁵, REMY PRECHELT¹¹, MAXIMILIAN REININGHAUS¹², WOLFGANG RHODE^{1,2}, FELIX RIEHN^{13,3}, MAXIMILIAN SACKEL^{1,2}, PRANAV SAMPATHKUMAR⁵, ALEXANDER SANDROCK⁸, JAN SOEDINGREKSO^{1,2}, and RALF ULRICH⁵ — ¹Technische Universität Dortmund (TU), Department of Physics, Dortmund, Germany — ²Lamarr Institute for Machine Learning and Artificial Intelligence, Dortmund, Germany — ³Universidade de Santiago de Compostela, Instituto Galego de Física de Altas Enerxías (IGFAE), Santiago de Compostela, Spain — ⁴Laboratoire Univers et Particules de Montpellier, Université de Montpellier, Montpellier, France — ⁵Karlsruhe Institute of Technology (KIT), Institute for Astroparticle Physics (IAP), Karlsruhe, Germany — ⁶University of Cincinnati, Cincinnati, OH, United States — ⁷Uppsala University, Department of Physics and Astronomy, Uppsala, Sweden — ⁸Bergische Universität Wuppertal, Department of Physics, Wuppertal, Germany — ⁹Vrije Universiteit Brussel, Astrophysical Institute, Brussels, Belgium — ¹⁰Universidad Nacional Autónoma de México (UNAM), Instituto de Ciencias Nucleares, Ciudad de Mexico, Mexico — ¹¹University of Hawai'i at Manoa, Department of Physics and Astronomy, Honolulu, United States — ¹²Karlsruhe Institute of Technology (KIT), Institute of Experimental Particle Physics (ETP), Karlsruhe, Germany — ¹³Laboratório de Instrumentação e Física Experimental de Partículas (LIP), Lisboa, Portugal

Coll 8: COSINUS-Collaboration

G ANGLÖHER¹, S BRAUN¹, M.R. BHARADWAJ¹, M. CABABIE^{2,3}, I COLANTONI^{4,6}, I DAFINEI^{5,6}, N. DI MARCO^{5,7}, C. DITTMARR¹, L. EINFALT^{2,3}, F. FERRELLA⁷, F. FERRONI^{5,6}, S. FICHTINGER², A. FILIPPONI^{7,8}, T. FRANK¹, M. FRIEDL², M. GAPP¹, E. GAIDO¹, Z. GE⁹, M. HEIKINHEIMO¹⁰, K. HEIM¹, M. N. HUGHES¹, K. HUITU¹⁰, M. KELLERMANN¹, R. MAJI^{2,3}, M. MANCUSO¹, L. PAGNANINI^{5,7}, F. PETRICCA¹, S. PIRRO⁷, F. PRÖBST¹, G. PROFETA^{7,8}, A. PUU⁷, F. REINDL^{2,3}, K. SCHÄFFNER¹, J. SCHIECK^{2,3}, P. SCHREINER^{2,3}, C. SCHWERTNER^{2,3}, K. SHERA¹, M. STAHLBERG¹, A. STENDAHL¹⁰, M. STUKEL^{7,11}, C. TRESCA^{7,12}, F. WAGNER^{2,13,14}, S. YUE⁹, V. ZEMA¹, Y. ZHU⁹, and L. ZIEGEL¹ — ¹Max-Planck-Institut für Physik, 85748

Garching - Germany — ²Institut für Hochenergiephysik der Österreichischen Akademie der Wissenschaften, 1050 Wien - Austria — ³Atominstytut, Technische Universität Wien, 1020 Wien - Austria — ⁴Consiglio Nazionale delle Ricerche, Istituto di Nanotecnologia, 00185 Roma, Italy — ⁵Gran Sasso Science Institute, 67100 L' Aquila - Italy — ⁶INFN - Sezione di Roma, 00185 Roma - Italy — ⁷INFN - Laboratori Nazionali del Gran Sasso, 67100 Assergi - Italy — ⁸Dipartimento di Scienze Fisiche e Chimiche, Università degli Studi dell' Aquila, 67100 L' Aquila - Italy — ⁹SICCAS Shanghai Institute of Ceramics, Shanghai - P.R.China 201899 — ¹⁰Helsinki Institute of Physics, 00014 University of Helsinki - Finland — ¹¹SNOLAB, P3Y 1N2 Lively - Canada — ¹²CNR-SPIN c/o Dipartimento di Scienze Fisiche e Chimiche, Università degli Studi dell Aquila, 67100 L' Aquila, Italy — ¹³Present address: Department of Physics, ETH Zurich, CH-8093 Zurich, Switzerland — ¹⁴Present address: ETH Zurich - PSI Quantum Computing Hub, Paul Scherrer Institute, CH-5232 Villigen, Switzerland

Coll 9: FAST-Collaboration

JUSTIN ALBURY¹, JOSE BELLIDO¹, FRASER BRADFIELD², LADISLAV CHYTKA³, JOHN FARMER⁴, TOSHIHIRO FUJII², PETR HAMAL⁵, PAVEL HORVÁTH⁵, MIROSLAV HRABOVSKÝ⁵, HIROMU IWASAKI⁸, VLAS-TIMIL JÍLEK^{3,5}, JAKUB KMEC^{3,5}, JIŘÍ KVITA⁵, MAX MALACARI⁴, DUŠAN MANDÁT³, MASSIMO MASTRODICASA⁶, JOHN MATTHEWS⁷, STANISLAV MICHAL⁵, HIROMU NAGASAWA⁸, HIROKI NAMBA⁸, MARCUS NIECHCIOL⁹, LIBOR NOŽKA⁵, MIROSLAV PALATKA³, MIROSLAV PECH³, PAOLO PRIVITERA⁴, SHUNSUKE SAKURAI², FRANCESCO SALAMIDA⁶, PETR SCHOVÁNEK³, RADOMIR SMIDA⁴, ZUZANA SVOZÍLKOVÁ⁵, AKIMICHI TAKETA¹⁰, KENTA TERAUCHI⁸, STAN THOMAS⁷, PETR TRÁVNÍČEK^{3,5}, and MARTIN VACULA^{3,5} — ¹Department of Physics, University of Adelaide, Adelaide, S.A., Australia — ²Graduate School of Science, Osaka Metropolitan University, Sumiyoshi-ku, Osaka, Japan — ³Institute of Physics of the Czech Academy of Sciences, Prague, Czech Republic — ⁴Kavli Institute for Cosmological Physics, University of Chicago, Chicago, IL, USA — ⁵Joint Laboratory of Optics of Palacký University and Institute of Physics of the Czech Academy of Sciences, Palacký University, Olomouc, Czech Republic — ⁶Department of Physical and Chemical Sciences, University of L'Aquila and INFN LNGS — ⁷High Energy Astrophysics Institute and Department of Physics and Astronomy, University of Utah, Salt Lake City, UT, USA — ⁸Graduate School of Science, Kyoto University, Sakyo-ku, Kyoto, Japan — ⁹Center for Particle Physics Siegen, University of Siegen, Siegen, Germany — ¹⁰Earthquake Research Institute, University of Tokyo, Bunkyo-ku, Tokyo, Japan

Coll 10: FlashCam-Collaboration

MIQUEL BARCELO⁴, CHRISTIAN BAUER⁴, CLARA ESCANUELA NIEVES⁴, CHRISTIAN FOEHR⁴, FABIA HAIST⁴, JIM HINTON⁴, SIMON SAILER⁴, SIMON STEINMASS⁴, ANNE TIMMERMANS⁴, THOMAS KIHM⁴, FELIX WERNER⁴, BAIYANG BI³, BASTIAN HESS³, GERD PÜHLHOFER³, ANDREA SANTANGELO³, SEBASTIAN DIEBOLD³, CHRISTOPH TENZER³, THOMAS SCHANZ³, PEDRO SILVA BATISTA², STEFAN FUNK², IRA JUNG-RICHARDT², OLEG KALEKIN², and OLAF REIMER¹ — ¹Universität Innsbruck, Innrain 52, 6020 Innsbruck, Österreich — ²Erlangen Centre for Astroparticle Physics, FAU Erlangen-Nürnberg, Nikolaus-Fiebiger-Straße 2, 91058 Erlangen, Deutschland — ³Eberhard Karls Universität Tübingen, Geschwister-Scholl-Platz, 72074 Tübingen, Deutschland — ⁴Max-Planck-Institut für Kernphysik, Saupfercheckweg 1, 69117 Heidelberg, Deutschland

Coll 11: FLASHForward-Collaboration

JONATHAN CHRISTOPHER WOOD¹, LEWIS BOULTON¹, PHILIPP BURGHART^{1,4}, JUDITA BEINORTAITE^{1,2}, JONAS BJÖRKLUND SVENSSON¹, GREGORY BOYLE¹, JAMES COWLEY³, ÁNGEL FERRAN POUSA¹, BRIAN FOSTER^{1,3}, MATTHEW JAMES GARLAND¹, PAU GONZÁLEZ-CAMINAL^{1,4}, MARYAM HUCK¹, HARRY JONES¹, ADAIT KANEKAR^{1,4}, CARL ANDREAS LINDSTRÖM^{1,5}, GREGOR LOISCH¹, TIANYUN LONG¹, STEVEN M MEWES^{1,4}, JENS OSTERHOFF¹, FELIPE PEÑA^{1,4}, SARAH SCHRÖDER¹, MAXENCE THÉVENET¹, STEPHAN WESCH¹, MATTHEW WING^{1,2}, and RICHARD D'ARCY^{1,3} — ¹Deutsches Elektronen-Synchrotron DESY, Hamburg, Germany — ²University College London, United Kingdom — ³University of Oxford, United Kingdom — ⁴University of Hamburg, Germany — ⁵University of Oslo, Norway

Coll 12: IBPT accelerator team-Collaboration

FALASTINE ABUSAIF, AXEL BERNHARD, EDMUND BLOMLEY, FELIPE DONOSO AGUIRRE, DIMA EL KHECHEN, SAMIRA FATEHI, STEFAN

FUNKNER, JULIAN GETHMANN, ANDREAS GRAU, BASTIAN HÄRER, BENNET KRASCH, ANTON MALLYGIN, WOLFGANG MEXNER, AKIRA MOCHIHASHI, MATTHIAS NABINGER, MICHAEL J. NASSE, JOSEPH NATAL, GUDRUN NIEHUES, MARVIN-DENNIS NOLL, ALEXANDER PAPASH, NATHAN RAY, MICHA REISSIG, ROBERT RUPRECHT, DAVID SAEZ DE JAUREGUI, ALEXANDER SAW, JENS SCHÄFER, THIEMO SCHMELZER, MARCEL SCHUH, MARKUS SCHWARZ, NIGEL SMALE, DAVID SQUIRES, JOHANNES STEINMANN, CHRISTINA WIDMANN, CHENRAN XU, ERIK BRÜNDERMANN, MATTHIAS FUCHS, and ANKE-SUSANNE MÜLLER — KIT, Karlsruhe, Deutschland

Coll 13: JEDI and CPEDM Collaborations-Collaboration

SAAD SIDDIQUE — GSI GmbH Darmstadt Germany

Coll 14: KAMATE-Collaboration

MAXIM ASTASCHOV², BEATE BORNSCHNEIN¹, SEBASTIAN BÖSER², AYA EL BOUSTANI², DARIUS FENNER², MARTIN FERTL², DAVID FRESE¹, TOBIAS GEIER¹, ROBIN GRÖSSLE¹, FLORIAN HANSS¹, LEONARD HASSELMANN¹, DAVID HILLESHEIMER¹, MAXIMILIAN HÜNEBORN², SEBASTIAN KOCH¹, DANIEL KURZ¹, ALEC LINDMAN², ELIAS LÜTKENHORST¹, ALEXANDER MARSTELLER¹, CHRISTIAN MATTHÉ², BRUNILDA MUCOGLAVA², FABIAN PIERMAIER², FLORIAN PRIESTER¹, CAROLINE RODENBECK¹, MARCO RÖLLIG¹, MAGNUS SCHLÖSSER¹, MICHAEL STURM¹, LARISA THORNE², THOMAS THÜMMER¹, and STEFAN WELTE¹ — ¹Karlsruher Institut für Technologie — ²Johannes Gutenberg-Universität Mainz

Coll 15: KM3NET-ERLANGEN-Collaboration

ALBA DOMI, THOMAS EBERL, TAMAS GAL, NICOLE GEISSELBRECHT, KAY GRAF, CHRISTIAN HAACK, LUKAS HENNIG, OLIVER JANIK, OLEG KALEKIN, ULI KATZ, CLAUDIO KOPPER, ROBERT LAHMANN, ANKE MOOSBRUGGER, RODRIGO GRACIA RUIZ, JUTTA SCHNABEL, JOHANNES SCHUMANN, FREDERIK ANDERSEN, and HANNES WARNHOFER — Erlangen Centre for Astroparticle Physics (ECAP), Friedrich-Alexander-Universität Erlangen-Nürnberg, Nikolaus-Fiebiger-Str. 2, 91058 Erlangen, Germany

Coll 16: Lohengrin-Collaboration

PHILIP BECHTLE¹, CHRISTIAN BESPIN¹, DOMINIQUE BRETON², CARLOS ORERO CANET⁴, KLAUS DESCH¹, HERBI DREINER¹, OLIVER FREYERMUTH¹, RHORRY GAULD^{1,3}, MARKUS GRUBER¹, CESAR BLANCH GUTIERREZ⁴, HAZEM HAJJAR¹, MATTHIAS HAMER¹, JAN-ERIC HEINRICHS¹, ADRIAN IRLER⁴, JOCHEN KAMINSKI¹, LANEY KLIPPHAHN¹, HANS KRÜGER¹, MICHAEL LUPBERGER¹, JIHANE MAALMI², ROMAN PÖSCHL², LEONIE RICHARZ^{1,6}, TOBIAS SCHIFFER¹, PATRICK SCHWÄBIG¹, MARTIN SCHÜRMAN¹, and DIRK ZERWAS⁵ — ¹Physikalisches Institut, Rheinische Friedrich-Wilhelms-Universität Bonn, Nussallee 12, Bonn, 53115, NRW, Germany — ²IJCLab Orsay, CNRS/IN2P3, 15 rue Georges Clemenceau, Orsay, 91405, France — ³Werner-Heisenberg-Institut, Max-Planck-Institut für Physik (MPP), Boltzmannstraße 8, Garching, 85748, Bavaria, Germany — ⁴Instituto de Fisica Corpuscular, Universitat de Valencia, Carrer del Vatedratic Jose Beltran Martinez 2, Valencia, 46980, Spain — ⁵DMLab, Deutsches Elektronen-Synchrotron DESY, CNRS/IN2P3, Hamburg, Germany — ⁶Department of Materials Science and Engineering, NTNU Norwegian University of Science and Technology, Sem Saelands vei 12, Trondheim, 7034, Norway

Coll 17: MADMAX-Collaboration

JUAN ARCILA MALDONADO¹, BERNARDO ARY DOS SANTOS GARCIA², DOMINIK BERGERMANN², STÉPHAN BEURTHEY³, HEE SU BYON¹, ALLEN CALDWELL¹, GIULIO CAPPELLI⁴, VIHAY DABHI³, CRISTINEL DIACONU³, JOHANNES DIEHL¹, BABETTE DÖBRICH¹, GIA DVALI¹, JACOB EGGE⁵, MARKO EKMEĐIĆ⁵, FABRICE GALLO³, ERIKA GARUTTI⁵, CHRISTOPHER GOOCH¹, STEFAN HEYMINCK⁶, THIBAUT HOUDY⁷, FABRICE HUBAUT³, ANTON IVANOV¹, JOSEF JOCHUM⁸, PIERRE KARST³, ALIREZA KAZEMPOUR¹, YOANN KERMAÏDIC⁷, DAVID KITTLINGER¹, STEFAN KNIRCK⁹, MICHAEL KRAMER⁶, DAGMAR KREIKEMEYER-LORENZO¹, CHRISTOPH KRIEGER⁵, GWENAEL LE-GAL⁴, DAVID LEPLA-WEBER¹⁰, AXEL LINDNER¹⁰, BÉLA MAJOROVITS¹, STEPHAN MARTENS⁵, ALBERTO MARTINI¹⁰, AKIRA MIYAZAKI⁷, GEORG OBERMÜLLER¹, ERDEM ÖZ², BARTHEL PHILIPPS², PASCAL PRALAVORIO³, GEORG RAFFELT¹, ARPIT RANADIVE⁴, JAVIER REDONDO¹¹, ANDREAS RINGWALD¹⁰, NICOLAS ROCH⁴, SAMUEL ROSET³, JÖRN SCHAFFRAN¹⁰, ALEXANDER SCHMIDT², ALEXANDER SEDLAK¹, ANDREW SONNENSCHNEIN⁹, FRANK STEFFEN¹, CHRISTIAN STRANDHAGEN⁸, IGOR USHEROV⁸, HAOTIAN WANG², GUNDOLF WIECHING⁶, and MAX ZIMMERMANN² — ¹MPI für Physik, München — ²RWTH Aachen — ³CPPM, Marseille, Frankreich

—⁴Institut NEEL, CNRS, Grenoble, Frankreich —⁵Universität Hamburg —⁶MPI für Radioastronomie, Bonn —⁷Université Paris-Saclay, CNRS/IN2P3, IJCLab, Frankreich —⁸Eberhard-Karls-Universität Tübingen —⁹Fermi National Accelerator Laboratory, USA —¹⁰DESY Hamburg —¹¹Universidad de Zaragoza, Spanien

Coll 18: MAGIX-Collaboration

PATRICK ACHENBACH¹⁶, MARKUS BALL⁴, JAN BERNAUER^{9,10}, MAIK BIROTH¹, LUCIE BISTER¹, NICOLAS BÖTTCHER¹, PHILIPP BRAND⁶, MIRCO CHRISTMANN^{1,2}, ETHAN CLINE⁹, LIRIDON DEDA⁶, ACHIM DENIG^{1,2,3}, LUCA DORIA^{1,3}, PETER DREXLER^{1,3}, SARA FECHNER¹, IVICA FRIŠČIĆ¹⁴, JOST FRONING⁶, PEPE GÜLKER¹, NILS HESSE¹, HANNAH KESSLER¹, ALFONS KHOUKAZ⁶, PASCAL KLAG¹, KONRAD KLEINEIDAM¹, MICHAEL KOHL¹¹, TIM KOLAR¹⁵, MICHAEL KONTOGIULAS¹, MATTEO LAUSS^{1,2}, MAXIMILIAN LITTICH¹, MICHAEL LUPBERGER⁵, DAVID MARKUS¹, HARALD MERKEL^{1,3}, MIHA MIHOVILOVIĆ^{1,7,8}, RICHARD MILNER¹², JONAS PÄTSCHKE¹, JAN RYGLEWSKI¹, SASKIA PLURA^{1,3}, LUKAS REITZ¹, SÖREN SCHLIMME¹, DANIEL SCHMITT¹, CONCETTINA SFIENTI^{1,3}, SIMON ŠIRCA^{7,8}, DANIEL STEGER¹, SEBASTIAN STENGEL^{1,2}, ELZBIETA STEPHAN¹³, CHRISTIAN STOSS¹, PHILIPP TEICHNER¹, SOPHIA VESTRICK⁶, MICHAEL WEIDE⁶, ANDRZEJ WILCZEK¹³, and LUCA WILHELM¹ —¹Institut für Kernphysik, Johannes Gutenberg-Universität, D-55099 Mainz, Germany —²Helmholtz Institute Mainz, GSI Helmholtzzentrum für Schwerionenforschung, Darmstadt, Johannes Gutenberg-Universität, D-55099 Mainz, Germany —³PRISMA+ Cluster of Excellence, Johannes Gutenberg-Universität, D-55099 Mainz, Germany —⁴Helmholtz-Institut für Strahlen- und Kernphysik, Rheinische Friedrich-Wilhelms-Universität, D-53115 Bonn, Germany —⁵Physikalisches Institut, Rheinische Friedrich-Wilhelms-Universität, D-53115 Bonn, Germany —⁶Institut für Kernphysik, Westfälische Wilhelms-Universität, D-48149 Münster, Germany —⁷Jožef Stefan Institute, SI-1000 Ljubljana, Slovenia —⁸Department of Physics, University of Ljubljana, SI-1000 Ljubljana, Slovenia —⁹Center for Frontiers in Nuclear Science, Department of Physics and Astronomy, Stony Brook University, New York 11794-3391, USA —¹⁰RIKEN BNL Research Center, Brookhaven National Laboratory, Upton, NY 11973-5000, USA —¹¹Department of Physics, Hampton University, Hampton, Virginia 23668, USA —¹²Laboratory for Nuclear Science, Massachusetts Institute of Technology, Cambridge, Massachusetts 02139, USA —¹³Institute of Physics, University of Silesia, 40-007, Katowice, Poland —¹⁴Department of Physics, University of Zagreb, HR-10002 Zagreb, Croatia —¹⁵School of Physics and Astronomy, Tel Aviv University, Tel Aviv 69978, Israel —¹⁶Thomas Jefferson National Accelerator Facility (JLab), Newport News, Virginia 23606, US

Coll 19: NuDoubt-Collaboration

MANUEL BÖHLES¹, SEBASTIAN BÖSER¹, MAGDALENA EISENHUTH¹, CLOÉ GIRARD-CARILLO¹, KITZIA M. HERNANDEZ CURIEL¹, BASILIAN KESSLER¹, KYRA MOSSEL¹, VERONIKA PALUŠOVÁ¹, STEFAN SCHOPPMANN², SUSANNA M. WAKELY¹, ALFONS WEBER¹, MIRIAM J. WEIGAND¹, and MICHAEL WURM¹ —¹Johannes Gutenberg-Universität Mainz, Institut für Physik, 55128 Mainz, Germany —²Johannes Gutenberg-Universität Mainz, Detektorlabor, Exzellenzcluster PRISMA+, 55128 Mainz, Germany

Coll 20: Pierre-Auger-Collaboration

A. ABDUL HALIM¹³, P. ABREU⁷⁰, M. AGLIETTA^{53,51}, I. ALLEKOTTE¹, K. ALMEIDA CHEMINANT^{78,77}, A. ALMELA^{7,12}, R. ALOISIO^{44,45}, J. ALVAREZ-MUÑOZ⁷⁶, A. AMBROSIO⁴⁴, J. AMMERMAN YEBRA⁷⁶, G.A. ANASTASI^{57,46}, L. ANCHORDOQUI⁸³, B. ANDRADA⁷, L. ANDRADE DOURADO^{44,45}, S. ANDRINGA⁷⁰, L. APOLLONIO^{58,48}, C. ARAMO⁴⁹, E. ARNONE^{62,51}, J.C. ARTEAGA VELÁZQUEZ⁶⁶, P. ASSIS⁷⁰, G. AVILA¹¹, E. AVOCONE^{56,45}, A. BAKALOVA³¹, F. BARBATO^{44,45}, A. BARTZ MOCELLIN⁸², J.A. BELLIDO¹³, C. BERAT³⁵, M.E. BERTAINA^{62,51}, M. BIANCIOTTO^{62,51}, P.L. BIERMANN⁸⁸, V. BINET⁵, K. BISMARCK^{38,7}, T. BISTER^{77,78}, J. BITEAU^{36,96}, J. BLAZEK³¹, J. BLÜMER⁴⁰, M. BOHÁČOVÁ³¹, D. BONCIOLI^{56,45}, C. BONIFAZI⁸, L. BONNEAU ARBELETCHÉ²², N. BORODAI⁶⁸, J. BRACK⁹³, P.G. BRICHETTO ORCHERA⁷, F.L. BRICHELE⁴¹, A. BUENO⁷⁵, S. BUITINK¹⁵, M. BUSCEMI^{46,57}, M. BÜSKEN^{38,7}, A. BWEMBYA^{77,78}, K.S. CABALLERO-MORA⁶⁵, S. CABANA-FREIRE⁷⁶, L. CACCIANIGA^{58,48}, F. CAMPUZANO⁶, J. CARAÇA-VALENTE⁸², R. CARUSO^{57,46}, A. CASTELLINA^{53,51}, F. CATALANI¹⁹, G. CATALDI⁴⁷, L. CAZON⁷⁶, M. CERDA¹⁰, B. ČERMÁKOVÁ⁴⁰, A. CERMENATI^{44,45}, J.A. CHINELLATO²², J. CHUDOBA³¹, L. CHYTKA³², R.W. CLAY¹³, A.C. COBOS CERUTTI⁶, R. COLALILLO^{59,49}, R. CONCEIÇÃO⁷⁰, A. CONDORELLI³⁶, G.

CONSOLATI^{48,54}, M. CONTE^{55,47}, F. CONVENGA^{56,45}, D. CORREIA DOS SANTOS²⁷, P.J. COSTA⁷⁰, C.E. COVAULT⁸¹, M. CRISTINZIANI⁴³, C.S. CRUZ SANCHEZ³, S. DASSO^{4,2}, K. DAUMILLER⁴⁰, B.R. DAWSON¹³, R.M. DE ALMEIDA²⁷, E.-T. DE BOONE⁴³, B. DE ERRICO²⁷, J. DE JESÚS^{7,40}, S.J. DE JONG^{77,78}, J.R.T. DE MELLO NETO²⁷, I. DE MITRI^{44,45}, J. DE OLIVEIRA¹⁸, D. DE OLIVEIRA FRANCO⁴², F. DE PALMA^{55,47}, V. DE SOUZA²⁰, E. DE VITO^{55,47}, A. DEL POPOLO^{57,46}, O. DELIGNY³³, N. DENNER³¹, L. DEVAL^{40,7}, A. DI MATTEO⁵¹, C. DOBRIGKEIT²², J.C. D'OLIVO⁶⁷, L.M. DOMINGUES MENDES^{16,70}, Q. DOROSTI⁴³, J.C. DOS ANJOS¹⁶, R.C. DOS ANJOS²⁶, J. EBR³¹, F. ELLWANGER⁴⁰, M. EMAM^{77,78}, R. ENGEL^{38,40}, I. EPICOCO^{55,47}, M. ERDMANN⁴¹, A. ETCHEGOYEN^{7,12}, C. EVOLI^{44,45}, H. FALCKE^{77,79,78}, G. FARRAR⁸⁵, A.C. FAUTH²², T. FEHLER⁴³, F. FELDBUSCH³⁹, A. FERNANDES⁷⁰, B. FICK⁸⁴, J.M. FIGUEIRA⁷, P. FILIP^{38,7}, A. FILIPČIĆ^{74,73}, T. FITOUSSI⁴⁰, B. FLAGGS⁸⁷, T. FODRAN⁷⁷, M. FREITAS⁷⁰, T. FUJII^{86,95}, A. FUSTER^{7,12}, C. GALEA⁷⁷, B. GARCÍA⁶, C. GAUDU³⁷, P.L. GHIA³³, U. GIACCARI⁴⁷, F. GOBBI¹⁰, F. GOLLAN⁷, G. GOLUP¹, M. GÓMEZ BERISSO¹, P.F. GÓMEZ VITALE¹¹, J.P. GONGORA¹¹, J.M. GONZÁLEZ¹, N. GONZÁLEZ⁷, D. GÓRA⁶⁸, A. GORGI^{53,51}, M. GOTTOVIK⁴⁰, F. GUARINO^{59,49}, G.P. GUEDES²³, E. GUIDO⁴³, L. GÜLZOW⁴⁰, S. HAHN³⁸, P. HAMAL³¹, M.R. HAMPPEL⁷, P. HANSEN³, V.M. HARVEY¹³, A. HAUNGS⁴⁰, T. HEBBEKER⁴¹, C. HOJVAT⁹¹, J.R. HÖRANDEL^{77,78}, P. HORVATH³², M. HRABOVSKÝ³², T. HUEGE^{40,15}, A. INSOLIA^{57,46}, P.G. ISAR⁷², P. JANECEK³¹, V. JILEK³¹, K.-H. KAMPERT³⁷, B. KEILHAUER⁴⁰, A. KHAKURDIKAR⁷⁷, V.V. KIZAKKE COVILAKAM^{7,40}, H.O. KLAGES⁴⁰, M. KLEIFGES³⁹, J. KÖHLER⁴⁰, F. KRIEGER⁴¹, M. KUBATOVA³¹, N. KUNKA³⁹, B.L. LAGO¹⁷, N. LANGNER⁴¹, M.A. LEIGUI DE OLIVEIRA²⁵, Y. LEMA-CAPEANS⁷⁶, A. LETESSIER-SELVON³⁴, I. LHENRY-YVON³³, L. LOPES⁷⁰, J.P. LUNDQUIST⁷³, A. MACHADO PAYERAS²², M. MALLAMACI^{60,46}, D. MANDAT³¹, B.C. MANNING¹³, P. MANTSCH⁹¹, F.M. MARIANI^{58,48}, A.G. MARIAZZI³, I.C. MARIŞ¹⁴, G. MARSELLA^{60,46}, D. MARTELLO^{55,47}, S. MARTINELLI^{40,7}, M.A. MARTINS⁷⁶, H.-J. MATHES⁴⁰, J. MATTHEWS⁹⁴, G. MATTHIAE^{61,50}, E. MAYOTTE⁸², S. MAYOTTE⁸², P.O. MAZUR⁹¹, G. MEDINA-TANCO⁶⁷, J. MEINERT³⁷, D. MELO⁷, A. MENSHIKOV³⁹, C. MERX⁴⁰, S. MICHAL³¹, M.I. MICHELETTI⁵, L. MIRAMONTI^{58,48}, M. MOGARKAR⁶⁸, S. MOLLERACH¹, F. MONTANET³⁵, L. MOREJON³⁷, K. MULREY^{77,78}, R. MUSSA⁵¹, W.M. NAMASAKA³⁷, S. NEGI³¹, L. NELLEN⁶⁷, K. NGUYEN⁸⁴, G. NICORA⁹, M. NIECHCIOL⁴³, D. NITZ⁸⁴, D. NOSEK³⁰, A. NOVIKOV⁸⁷, V. NOVOTNY³⁰, L. NOŽKA³², A. NUCITA^{55,47}, L.A. NÚÑEZ²⁹, J. OCHOA⁷, C. OLIVEIRA²⁰, L. ÖSTMAN³¹, M. PALATKA³¹, J. PALLOTTA⁹, S. PANJA³¹, G. PARENTE⁷⁶, T. PAULSEN³⁷, J. PAWLOWSKY³⁷, M. PECH³¹, J. PEKALA⁶⁸, R. PELAYO⁶⁴, V. PELGRIMS¹⁴, L.A.S. PEREIRA²⁴, E.E. PEREIRA MARTINS^{38,7}, C. PÉREZ BERTOLLI^{7,40}, L. PERRONE^{55,47}, S. PETRERA^{44,45}, C. PETRUCCI⁵⁶, T. PIEROG⁴⁰, M. PIMENTA⁷⁰, M. PLATINO⁷, B. PONT⁷⁷, M. POURMOHAMMAD SHAHVAR^{60,46}, P. PRIVITERA⁸⁶, M. PROUZA³¹, K. PYTEL⁶⁹, S. QUERCHFELD³⁷, J. RAUTENBERG³⁷, D. RAVIGNANI⁷, J.V. REGINATTO AKIM²², A. REUZKI⁴¹, J. RIDKY³¹, F. RIEHN^{76,97}, M. RISSE⁴³, V. RIZI^{56,45}, E. RODRIGUEZ^{7,40}, G. RODRIGUEZ FERNANDEZ⁵⁰, J. RODRIGUEZ ROJO¹¹, M.J. RONCORONI⁷, S. ROSSON⁴², M. ROTH⁴⁰, E. ROULET¹, A.C. ROVERO⁴, A. SAFTOIU⁷¹, M. SAHARAN⁷⁷, F. SALAMIDA^{56,45}, H. SALAZAR⁶³, G. SALINA⁵⁰, P. SAMPATHKUMAR⁴⁰, N. SAN MARTIN⁸², J.D. SANABRIA GOMEZ²⁹, F. SÁNCHEZ⁷, E.M. SANTOS²¹, E. SANTOS³¹, F. SARAZIN⁸², R. SARMENTO⁷⁰, R. SATO¹¹, P. SAVINA^{44,45}, V. SCHERINI^{55,47}, H. SCHIELER⁴⁰, M. SCHIMASSEK³³, M. SCHIMP³⁷, D. SCHMIDT⁴⁰, O. SCHOLTEN^{15,89}, H. SCHOORLEMMER^{77,78}, P. SCHOVÁNEK³¹, F.G. SCHRÖDER^{87,40}, J. SCHULTE⁴¹, T. SCHULZ^{40,7}, S.J. SCIUTTO³, M. SCORNAVACCHE^{7,40}, A. SEDOSKI⁷, A. SEGRETO^{52,46}, S. SEHGAL³⁷, S.U. SHIVASHANKARA⁷³, G. SIGL⁴², K. SIMKOVA^{15,14}, F. SIMON³⁹, R. ŠMÍDA⁸⁶, P. SOMMERS⁹², R. SQUARTINI¹⁰, M. STADELMAIER^{40,48,58}, S. STANIČ⁷³, J. STASIELAK⁶⁸, P. STASSI³⁵, S. STRÄHNZ³⁸, M. STRAUB⁴¹, T. SUOMIJÄRVI³⁶, A.D. SUPANITSKY⁷, Z. SVOZILIKOVA³¹, Z. SZADKOWSKI⁶⁹, F. TAIRLI¹³, A. TAPIA²⁸, C. TARICCO^{62,51}, C. TIMMERMANS^{78,77}, O. TKACHENKO³¹, P. TOBISKA³¹, C.J. TODERO PEIXOTO¹⁹, B. TOMÉ⁷⁰, A. TRAVAINI¹⁰, P. TRAVNICEK³¹, M. TUEROS³, M. UNGER⁴⁰, R. UZEIROSKA³⁷, L. VACLAVEK³², M. VACULA³², I. VAIMAN^{44,45}, J.F. VALDÉS GALICIA⁶⁷, L. VALORE^{59,49}, E. VARELA⁶³, V. VAŠÍČKOVÁ³⁷, A. VÁSQUEZ-RAMÍREZ²⁹, D. VEBERÍČ⁴⁰, I.D. VERGARA QUISPE³, S. VERPOEST⁸⁷, V. VERZI⁵⁰, J. VICHÁ³¹, J. VINK⁸⁰, S. VOROBIOV⁷³, J.B. VUTA³¹, C. WATANABE²⁷, A.A. WATSON⁹⁰, A. WEINDL⁴⁰, M. WEITZ³⁷, L. WIENCKE⁸², H. WILCZYŃSKI⁶⁸, D. WITTKOWSKI³⁷, B. WUNDHEILER⁷, B. YUE³⁷, A.

YUSHKOV³¹, E. ZAS⁷⁶, D. ZAVRTANIK^{73,74}, and M. ZAVRTANIK^{74,73} — ¹Centro Atómico Bariloche and Instituto Balseiro (CNEA-UNCuyo-CONICET), San Carlos de Bariloche, Argentina — ²Departamento de Física and Departamento de Ciencias de la Atmósfera y los Océanos, FCEyN, Universidad de Buenos Aires and CONICET, Buenos Aires, Argentina — ³IFLP, Universidad Nacional de La Plata and CONICET, La Plata, Argentina — ⁴Instituto de Astronomía y Física del Espacio (IAFE, CONICET-UBA), Buenos Aires, Argentina — ⁵Instituto de Física de Rosario (IFIR) – CONICET/U.N.R. and Facultad de Ciencias Bioquímicas y Farmacéuticas U.N.R., Rosario, Argentina — ⁶Instituto de Tecnologías en Detección y Astropartículas (CNEA, CONICET, UNSAM), and Universidad Tecnológica Nacional – Facultad Regional Mendoza (CONICET/CNEA), Mendoza, Argentina — ⁷Instituto de Tecnologías en Detección y Astropartículas (CNEA, CONICET, UNSAM), Buenos Aires, Argentina — ⁸International Center of Advanced Studies and Instituto de Ciencias Físicas, ECyT-UNSAM and CONICET, Campus Miguelete – San Martín, Buenos Aires, Argentina — ⁹Laboratorio Atmósfera – Departamento de Investigaciones en Láseres y sus Aplicaciones – UNIDEF (CITEDEF-CONICET), Argentina — ¹⁰Observatorio Pierre Auger, Malargüe, Argentina — ¹¹Observatorio Pierre Auger and Comisión Nacional de Energía Atómica, Malargüe, Argentina — ¹²Universidad Tecnológica Nacional – Facultad Regional Buenos Aires, Buenos Aires, Argentina — ¹³University of Adelaide, Adelaide, S.A., Australia — ¹⁴Université Libre de Bruxelles (ULB), Brussels, Belgium — ¹⁵Vrije Universiteit Brussels, Brussels, Belgium — ¹⁶Centro Brasileiro de Pesquisas Físicas, Rio de Janeiro, RJ, Brazil — ¹⁷Centro Federal de Educação Tecnológica Celso Suckow da Fonseca, Petropolis, Brazil — ¹⁸Instituto Federal de Educação, Ciência e Tecnologia do Rio de Janeiro (IFRJ), Brazil — ¹⁹Universidade de São Paulo, Escola de Engenharia de Lorena, Lorena, SP, Brazil — ²⁰Universidade de São Paulo, Instituto de Física de São Carlos, São Carlos, SP, Brazil — ²¹Universidade de São Paulo, Instituto de Física, São Paulo, SP, Brazil — ²²Universidade Estadual de Campinas (UNICAMP), IFGW, Campinas, SP, Brazil — ²³Universidade Estadual de Feira de Santana, Feira de Santana, Brazil — ²⁴Universidade Federal de Campina Grande, Centro de Ciências e Tecnologia, Campina Grande, Brazil — ²⁵Universidade Federal do ABC, Santo André, SP, Brazil — ²⁶Universidade Federal do Paraná, Setor Palotina, Palotina, Brazil — ²⁷Universidade Federal do Rio de Janeiro, Instituto de Física, Rio de Janeiro, RJ, Brazil — ²⁸Universidad de Medellín, Medellín, Colombia — ²⁹Universidad Industrial de Santander, Bucaramanga, Colombia — ³⁰Charles University, Faculty of Mathematics and Physics, Institute of Particle and Nuclear Physics, Prague, Czech Republic — ³¹Institute of Physics of the Czech Academy of Sciences, Prague, Czech Republic — ³²Palacky University, Olomouc, Czech Republic — ³³CNRS/IN2P3, IJCLab, Université Paris-Saclay, Orsay, France — ³⁴Laboratoire de Physique Nucléaire et de Hautes Energies (LPNHE), Sorbonne Université, Université de Paris, CNRS-IN2P3, Paris, France — ³⁵Univ. Grenoble Alpes, CNRS, Grenoble Institute of Engineering Univ. Grenoble Alpes, LPSC-IN2P3, 38000 Grenoble, France — ³⁶Université Paris-Saclay, CNRS/IN2P3, IJCLab, Orsay, France — ³⁷Bergische Universität Wuppertal, Department of Physics, Wuppertal, Germany — ³⁸Karlsruhe Institute of Technology (KIT), Institute for Experimental Particle Physics, Karlsruhe, Germany — ³⁹Karlsruhe Institute of Technology (KIT), Institut für Prozessdatenverarbeitung und Elektronik, Karlsruhe, Germany — ⁴⁰Karlsruhe Institute of Technology (KIT), Institute for Astroparticle Physics, Karlsruhe, Germany — ⁴¹RWTH Aachen University, III. Physikalisches Institut A, Aachen, Germany — ⁴²Universität Hamburg, II. Institut für Theoretische Physik, Hamburg, Germany — ⁴³Universität Siegen, Department Physik – Experimentelle Teilchenphysik, Siegen, Germany — ⁴⁴Gran Sasso Science Institute, L’Aquila, Italy — ⁴⁵INFN Laboratori Nazionali del Gran Sasso, Assergi (L’Aquila), Italy — ⁴⁶INFN, Sezione di Catania, Catania, Italy — ⁴⁷INFN, Sezione di Lecce, Lecce, Italy — ⁴⁸INFN, Sezione di Milano, Milano, Italy — ⁴⁹INFN, Sezione di Napoli, Napoli, Italy — ⁵⁰INFN, Sezione di Roma “Tor Vergata”, Roma, Italy — ⁵¹INFN, Sezione di Torino, Torino, Italy — ⁵²Istituto di Astrofisica Spaziale e Fisica Cosmica di Palermo (INAF), Palermo, Italy — ⁵³Osservatorio Astrofisico di Torino (INAF), Torino, Italy — ⁵⁴Politecnico di Milano, Dipartimento di Scienze e Tecnologie Aerospaziali, Milano, Italy — ⁵⁵Università del Salento, Dipartimento di Matematica e Fisica “E. De Giorgi”, Lecce, Italy — ⁵⁶Università dell’Aquila, Dipartimento di Scienze Fisiche e Chimiche, L’Aquila, Italy — ⁵⁷Università di Catania, Dipartimento di Fisica e Astronomia “Ettore Majorana”, Catania, Italy — ⁵⁸Università di Milano, Dipartimento di Fisica, Milano, Italy — ⁵⁹Università di Napoli “Federico II”, Dipartimento di Fisica “Ettore

Pancini”, Napoli, Italy — ⁶⁰Università di Palermo, Dipartimento di Fisica e Chimica “E. Segre”, Palermo, Italy — ⁶¹Università di Roma “Tor Vergata”, Dipartimento di Fisica, Roma, Italy — ⁶²Università Torino, Dipartimento di Fisica, Torino, Italy — ⁶³Benemérita Universidad Autónoma de Puebla, Puebla, México — ⁶⁴Unidad Profesional Interdisciplinaria en Ingeniería y Tecnologías Avanzadas del Instituto Politécnico Nacional (UPIITA-IPN), México, D.F., México — ⁶⁵Universidad Autónoma de Chiapas, Tuxtla Gutiérrez, Chiapas, México — ⁶⁶Universidad Michoacana de San Nicolás de Hidalgo, Morelia, Michoacán, México — ⁶⁷Universidad Nacional Autónoma de México, México, D.F., México — ⁶⁸Institute of Nuclear Physics PAN, Krakow, Poland — ⁶⁹University of Łódź, Faculty of High-Energy Astrophysics, Łódź, Poland — ⁷⁰Laboratório de Instrumentação e Física Experimental de Partículas – LIP and Instituto Superior Técnico – IST, Universidade de Lisboa – UL, Lisboa, Portugal — ⁷¹“Horia Hulubei” National Institute for Physics and Nuclear Engineering, Bucharest-Magurele, Romania — ⁷²Institute of Space Science, Bucharest-Magurele, Romania — ⁷³Center for Astrophysics and Cosmology (CAC), University of Nova Gorica, Nova Gorica, Slovenia — ⁷⁴Experimental Particle Physics Department, J. Stefan Institute, Ljubljana, Slovenia — ⁷⁵Universidad de Granada and C.A.F.P.E., Granada, Spain — ⁷⁶Instituto Galego de Física de Altas Enerxías (IGFAE), Universidade de Santiago de Compostela, Santiago de Compostela, Spain — ⁷⁷IMAPP, Radboud University Nijmegen, Nijmegen, The Netherlands — ⁷⁸Nationaal Instituut voor Kernfysica en Hoge Energie Fysica (NIKHEF), Science Park, Amsterdam, The Netherlands — ⁷⁹Stichting Astronomisch Onderzoek in Nederland (ASTRON), Dwingeloo, The Netherlands — ⁸⁰Universiteit van Amsterdam, Faculty of Science, Amsterdam, The Netherlands — ⁸¹Case Western Reserve University, Cleveland, OH, USA — ⁸²Colorado School of Mines, Golden, CO, USA — ⁸³Department of Physics and Astronomy, Lehman College, City University of New York, Bronx, NY, USA — ⁸⁴Michigan Technological University, Houghton, MI, USA — ⁸⁵New York University, New York, NY, USA — ⁸⁶University of Chicago, Enrico Fermi Institute, Chicago, IL, USA — ⁸⁷University of Delaware, Department of Physics and Astronomy, Bartol Research Institute, Newark, DE, USA — ⁸⁸Max-Planck-Institut für Radioastronomie, Bonn, Germany — ⁸⁹also at Kapteyn Institute, University of Groningen, Groningen, The Netherlands — ⁹⁰School of Physics and Astronomy, University of Leeds, Leeds, United Kingdom — ⁹¹Fermi National Accelerator Laboratory, Fermilab, Batavia, IL, USA — ⁹²Pennsylvania State University, University Park, PA, USA — ⁹³Colorado State University, Fort Collins, CO, USA — ⁹⁴Louisiana State University, Baton Rouge, LA, USA — ⁹⁵now at Graduate School of Science, Osaka Metropolitan University, Osaka, Japan — ⁹⁶Institut universitaire de France (IUF), France — ⁹⁷now at Technische Universität Dortmund and Ruhr-Universität Bochum, Dortmund and Bochum, Germany

Coll 21: P-ONE-Collaboration

BEN NÜHRENBÖRGER, LEA GINZKEY, CHRISTIAN SPANNFELLNER, LAURA WINTER, VINCENT GOUSY-LEBLANC, ELISA RESCONI, MICHAEL BÖHMER, and ROMAN GERMHÄUSER — Department of Physics, Technical University of Munich, Germany

Coll 22: SHiP-SBT-Collaboration

KATHARINA ALBRECHT¹, DAVID ARUTINOV², ILJA BEKMANN², MANUEL BÖHLES³, LUKAS BREITWIESER⁴, ALESSIA BRIGNOLI¹, PATRICK DEUCHER³, CONSTANTIN ECKARDT¹, FELIZITAS FALLER⁴, HORST FISCHER⁴, CHRISTIAN GREWING², ANNIKA HOLLNAGEL³, ANDRÉS KROLLA⁴, HEIKO LACKER¹, FAIRHURST LYONS⁴, JOHANNES A. MOLINS I BERTRAM³, TIM MOLZBERGER⁴, ANNE SOPHIE MÜLLER⁴, ANUPAMA REGHNATH¹, FLORIAN REHBEIN⁵, TILMAN ROCK⁴, FLORIAN RÖSSING², CHRISTIAN SCHARF¹, MARC SCHUMANN⁴, STEFAN VAN WAASEN², JAMES M WEBB⁴, JOHANNES WENK⁴, IDA WÖSTHEINRICH¹, MICHAEL WURM³, and ANDRÉ ZAMBANINI² — ¹HU Berlin, Institut für Physik, 12489 Berlin (DE) — ²FZ Jülich, ICA (PGI-4), 52428 Jülich (DE) — ³JGU Mainz, Institut für Physik, 55128 Mainz (DE) — ⁴ALU Freiburg, Physikalisches Institut, 79104 Freiburg (DE) — ⁵currently RWTH Aachen, Physikalisches Institut III A, 52074 Aachen (DE)

Coll 23: WASP-121 b JWST/NIRSpec transit-Collaboration

CYRIL GAPP¹, THOMAS M. EVANS-SOMA^{2,1}, JOANNA K. BARSTOW³, JOSHUA D. LOTHINGER^{4,5}, DAVID K. SING^{6,7}, DJEMMA RUSEVA^{1,8}, EVA-MARIA AHRER¹, JAYESH M. GOYAL⁹, DUNCAN CHRISTIE¹, LAURA KREIDBERG¹, and NATHAN J. MAYNE¹⁰ — ¹Max-Planck-Institut für Astronomie, Königstuhl 17, D-69117 Heidelberg, Germany — ²School of Information and Physical Sciences, University of New-

castle, Callaghan, NSW, Australia — ³School of Physical Sciences, The Open University, Walton Hall, Milton Keynes, MK7 6AA, UK — ⁴Space Telescope Science Institute, 3700 San Martin Drive, Baltimore, MD 21218, USA — ⁵Department of Physics, Utah Valley University, 800 W University Pkwy, Orem, UT 84058, USA — ⁶Department of Earth & Planetary Sciences, Johns Hopkins University, Baltimore, MD, USA — ⁷Department of Physics & Astronomy, Johns Hopkins

University, Baltimore, MD, USA — ⁸University of St Andrews, North Haugh, St Andrews, KY16 9SS, UK — ⁹School of Earth and Planetary Sciences (SEPS), National Institute of Science Education and Research (NISER), Jatani, India — ¹⁰Department of Physics and Astronomy, Faculty of Environment, Science and Economy, University of Exeter, Exeter EX4 4QL, UK