# $AUTHORS\ AND\ ACKNOWLEDGEMENTS\ FOR$ MULTI-MESSENGER OBSERVATIONS OF A BINARY NEUTRON STAR MERGER

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J. B. Haislip,  $^{399}$  V. V. Kouprianov,  $^{399}$  D. E. Reichart,  $^{399}$  D. J. Sand,  $^{400}$  L. Tartaglia,  $^{400,\,401}$  S. Valenti,  $^{401}$  and S. Yang  $^{401,\,402,\,403}$ 

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S. Benetti, <sup>404</sup> E. Brocato, <sup>405</sup> S. Campana, <sup>406</sup> E. Cappellaro, <sup>404</sup> S. Covino, <sup>406</sup> P. D'Avanzo, <sup>406</sup> V. D'Elia, <sup>405,407</sup> F. Getman, <sup>408</sup> G. Ghirlanda, <sup>406</sup> G. Ghisellini, <sup>406</sup> L. Limatola, <sup>408</sup> L. Nicastro, <sup>409</sup> E. Palazzi, <sup>409</sup> E. Pian, <sup>409</sup> S. Piranomonte, <sup>405</sup> A. Possenti, <sup>313</sup> A. Rossi, <sup>409</sup> O. S. Salafia, <sup>410,406</sup> L. Tomasella, <sup>404</sup> L. Amati, <sup>409</sup> L. A. Antonelli, <sup>405</sup> M. G. Bernardini, <sup>411,406</sup> F. Bufano, <sup>412</sup> M. Capaccioli, <sup>408,413</sup> P. Casella, <sup>405</sup> M. Dadina, <sup>409</sup> G. De Cesare, <sup>409</sup> A. Di Paola, <sup>405</sup> G. Giuffrida, <sup>405</sup> A. Giunta, <sup>405</sup> G. L. Israel, <sup>405</sup> M. Lisi, <sup>405</sup> E. Maiorano, <sup>409</sup> M. Mapelli, <sup>404,414</sup> N. Masetti, <sup>409,415</sup> A. Pescalli, <sup>416,406</sup> L. Pulone, <sup>405</sup> R. Salvaterra, <sup>417</sup> P. Schipani, <sup>408</sup> M. Spera, <sup>404</sup> A. Stamerra, <sup>146,418</sup> L. Stella, <sup>405</sup> V. Testa, <sup>405</sup> M. Turatto, <sup>404</sup> D. Vergani, <sup>409</sup> G. Aresu, <sup>313</sup> M. Bachetti, <sup>313</sup> F. Buffa, <sup>313</sup> M. Burgay, <sup>313</sup> M. Buttu, <sup>313</sup> T. Caria, <sup>313</sup> E. Carretti, <sup>313</sup> V. Casasola, <sup>419</sup> P. Castangia, <sup>313</sup> G. Carboni, <sup>313</sup> S. Casu, <sup>313</sup> R. Concu, <sup>313</sup> A. Corongiu, <sup>313</sup> G. L. Deiana, <sup>313</sup> E. Egron, <sup>313</sup> A. Fara, <sup>313</sup> F. Gaudiomonte, <sup>313</sup> V. Gusai, <sup>313</sup> A. Ladu, <sup>313</sup> S. Loru, <sup>313</sup> S. Leurini, <sup>313</sup> P. Ortu, <sup>313</sup> S. Palmas, <sup>313</sup> G. Melis, <sup>313</sup> Carlo Migoni, <sup>313</sup> Sabrina Milia, <sup>313</sup> Alessandro Navarrini, <sup>313</sup> A. Orlati, <sup>314</sup> P. Ortu, <sup>313</sup> S. Palmas, <sup>313</sup> G. Serra, <sup>313</sup> M. Serrau, <sup>313</sup> M. Starni, <sup>420</sup> G. Surcis, <sup>313</sup> V. Vacca, <sup>313</sup> G. P. Vargiu, <sup>313</sup> S. Righini, <sup>420</sup> A. Saba, <sup>313</sup> G. Serra, <sup>313</sup> M. Serrau, <sup>313</sup> M. Starni, <sup>420</sup> G. Surcis, <sup>313</sup> V. Vacca, <sup>313</sup> G. P. Vargiu, <sup>314</sup> J. Selsing, <sup>329</sup> S. D. Vergani, <sup>430</sup> M. Gao, <sup>436</sup> A. Gomboc, <sup>437</sup> L. Kaper, <sup>438</sup> S. Kobayashi, <sup>439</sup> D. Kopac, <sup>440</sup> J. Mao, <sup>441</sup> R. L. C. Starling, <sup>431</sup> I. Stele, <sup>442</sup> And A. J. Van der Horst<sup>443,424</sup>

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#### (ATCA: AUSTRALIA TELESCOPE COMPACT ARRAY)

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# (LAS CUMBRES OBSERVATORY GROUP)

J. COOKE, <sup>508,509,510</sup> M. BAILES, <sup>508,509</sup> C. WOLF, <sup>511,510,509</sup> A. T. DELLER, <sup>508,509,510</sup> C. LIDMAN, <sup>512,510</sup> L. WANG, <sup>513,514,515</sup> B. GENDRE, <sup>516</sup> I. ANDREONI, <sup>508,509,512,510</sup> K. ACKLEY, <sup>517</sup> T. A. PRITCHARD, <sup>508</sup> M. S. BESSELL, <sup>511</sup> S.-W. CHANG, <sup>511,510</sup> A. MÖLLER, <sup>511,510</sup> C. A. ONKEN, <sup>511,510</sup> R. A. SCALZO, <sup>511,510,518</sup> R. RIDDEN-HARPER, <sup>511</sup> R. G. SHARP, <sup>511,510</sup> B. E. TUCKER, <sup>511,510</sup> T. J. FARRELL, <sup>512</sup> E. ELMER, <sup>519</sup> S. JOHNSTON, <sup>520,510</sup> V. VENKATRAMAN KRISHNAN, <sup>508,510</sup> E. F. KEANE, <sup>521,510</sup> J. A. GREEN, <sup>520</sup> A. JAMESON, <sup>508,510</sup> L. HU, <sup>514,515</sup> B. MA, <sup>522,515</sup> T. SUN, <sup>514,515</sup> X. WU, <sup>514,515</sup> X. WANG, <sup>523</sup> Z. SHANG, <sup>522,524,515</sup> Y. HU, <sup>522,515</sup> M. C. B. ASHLEY, <sup>525</sup> X. YUAN, <sup>526,515</sup> C. TAO, <sup>523</sup> Z. ZHU, <sup>527</sup> H. ZHANG, <sup>528</sup> N. B. SUNTZEFF, <sup>513</sup> J. ZHOU, <sup>528</sup> J. YANG, <sup>514</sup> B. ORANGE, <sup>529</sup> D. MORRIS, <sup>516</sup> A. CUCCHIARA, <sup>516</sup> T. GIBLIN, <sup>530</sup> A. KLOTZ, <sup>531</sup> J. STAFF, <sup>516</sup> P. THIERRY, <sup>532</sup> B. P. SCHMIDT, <sup>533,510</sup> N. R. TANVIR, <sup>534</sup> A. J. LEVAN, <sup>301</sup> Z. CANO, <sup>535</sup> C. COPPERWHEAT, <sup>536</sup> A. DE UGARTE-POSTIGO, <sup>535,329</sup> P. EVANS, <sup>534</sup>

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#### (MASTER COLLABORATION)

F. ABE, <sup>560</sup> K. AOKI, <sup>561</sup> W. AOKI, <sup>562</sup> Y. ASAKURA, <sup>560,‡</sup> S. BAAR, <sup>563</sup> S. BARWAY, <sup>564</sup> I. A. BOND, <sup>565</sup> M. DOI, <sup>566</sup> F. FINET, <sup>561</sup> T. FUJIYOSHI, <sup>561</sup> H. FURUSAWA, <sup>562</sup> S. HONDA, <sup>563</sup> R. ITOH, <sup>567</sup> N. KANDA, <sup>568</sup> K. S. KAWABATA, <sup>569</sup> M. KAWABATA, <sup>570</sup> J. H. KIM, <sup>561</sup> S. KOSHIDA, <sup>561</sup> D. KURODA, <sup>571</sup> C.-H. LEE, <sup>561</sup> W. LIU, <sup>569,572</sup> K. MATSUBAYASHI, <sup>571</sup> S. MIYAZAKI, <sup>573</sup> K. MORIHANA, <sup>574</sup> T. MOROKUMA, <sup>566</sup> K. MOTOHARA, <sup>566</sup> K. L. MURATA, <sup>567</sup> H. NAGAI, <sup>562</sup> H. NAGASHIMA, <sup>570</sup> T. NAGAYAMA, <sup>575</sup> T. NAKAOKA, <sup>570</sup> F. NAKATA, <sup>561</sup> R. OHSAWA, <sup>566</sup> T. OHSHIMA, <sup>563</sup> K. OHTA, <sup>576</sup> H. OKITA, <sup>561</sup> T. SAITO, <sup>563</sup> Y. SAITO, <sup>567</sup> S. SAKO, <sup>566,577</sup> Y. SEKIGUCHI, <sup>578</sup> T. SUMI, <sup>573</sup> A. TAJITSU, <sup>561</sup> J. TAKAHASHI, <sup>563</sup> M. TAKAYAMA, <sup>563</sup> Y. TAMURA, <sup>574</sup> I. TANAKA, <sup>561</sup> M. TANAKA, <sup>562</sup> M. TANAKA, <sup>562</sup> T. TERAI, <sup>561</sup> N. TOMINAGA, <sup>579,580</sup> P. J. TRISTRAM, <sup>581</sup> M. UEMURA, <sup>569</sup> Y. UTSUMI, <sup>569</sup> M. S. YAMAGUCHI, <sup>566</sup> N. YASUDA, <sup>580</sup> M. Yoshida,<sup>561</sup> and T. Zenko<sup>576</sup>

S. M. Adams, <sup>582</sup> J. R. Allison, <sup>496,497</sup> G. C. Anupama, <sup>583</sup> J. Bally, <sup>584</sup> J. Barnes, <sup>585</sup> S. Barway, <sup>586</sup> E. Bellm, <sup>587</sup> N. Blagorodnova, <sup>582</sup> C. Cannella, <sup>582</sup> P. Chandra, <sup>588</sup> D. Chatterjee, <sup>589</sup> T. E. Clarke, <sup>590</sup> B. E. Cobb, <sup>591</sup> D. O. Cook, <sup>582</sup> C. Copperwheat, <sup>442</sup> K. De, <sup>582</sup> S. W. K. Emery, <sup>592</sup> P. A. Evans, <sup>593</sup> U. Feindt, <sup>594</sup> K. Foster, <sup>582</sup> O. D. Fox, <sup>595</sup> D. A. Frail, <sup>596</sup> D. A. Frail, <sup>596</sup> D. A. Frail, <sup>596</sup> D. A. Frail, <sup>597</sup> D. A. Frail, <sup>598</sup> D. Charterjee, <sup>588</sup> O. D. Fox, <sup>589</sup> D. A. Frail, <sup>598</sup> D. A. Frail, <sup>599</sup> C. Fremling, <sup>582</sup> C. Frohmaier, <sup>597,598</sup> J. A. Garcia, <sup>582</sup> S. Ghosh, <sup>589</sup> S. Giacintucci, <sup>590</sup> A. Goobar, <sup>594</sup> O. Gottlieb, <sup>599</sup> C. Fremling, <sup>362</sup> C. Frohmaier, <sup>397</sup>, <sup>398</sup> J. A. Garcia, <sup>382</sup> S. Ghosh, <sup>389</sup> S. Giacintucci, <sup>590</sup> A. Goobar, <sup>594</sup> O. Gottlieb, <sup>599</sup> B. W. Grefenstette, <sup>582</sup> G. Hallinan, <sup>582</sup> F. Harrison, <sup>582</sup> M. Heida, <sup>582</sup> G. Helou, <sup>600</sup> A. Y. Q. Ho, <sup>582</sup> A. Horesh, <sup>601</sup> K. Hotokezaka, <sup>602</sup> W.-H. Ip, <sup>603</sup> R. Itoh, <sup>604</sup> Bob Jacobs, <sup>66</sup> J. E. Jencson, <sup>582</sup> D. Kasen, <sup>605</sup>, <sup>606</sup> M. M. Kasliwal, <sup>582</sup> N. E. Kassim, <sup>590</sup> H. Kim, <sup>607</sup> B. S. Kiran, <sup>583</sup> N.P.M. Kuin, <sup>592</sup> S.R. Kulkarni, <sup>582</sup> T. Kupfer, <sup>582</sup> R. M. Lau, <sup>582</sup> K. Madsen, <sup>582</sup> P. A. Mazzali, <sup>442</sup>, <sup>608</sup> A. A. Miller, <sup>609</sup>, <sup>610</sup> H Miyasaka, <sup>582</sup> K. Mooley, <sup>611</sup> S. T. Myers, <sup>596</sup> E. Nakar, <sup>599</sup> C.-C. Ngeow, <sup>603</sup> P. Nugent, <sup>605</sup>, <sup>355</sup> E. O. Ofek, <sup>612</sup> N. Palliyaguru, <sup>613</sup> M. Pavana, <sup>583</sup> D. A. Perley, <sup>614</sup> W. M. Peters, <sup>590</sup> S. Pike, <sup>582</sup> T. Piran, <sup>601</sup> H. Qi, <sup>589</sup> R. M. Quimby, <sup>615</sup>, <sup>616</sup> J. Rana, <sup>19</sup> S. Rosswog, <sup>617</sup> F. Rusu, <sup>618</sup> E. M. Sadler, <sup>496</sup>, <sup>619</sup> A. Van Sistine, <sup>589</sup> J. Sollerman, <sup>617</sup> Y. Xu, <sup>582</sup> L. Yan, <sup>582</sup>, <sup>5600</sup> Y. Yatsu, <sup>604</sup> P.-C. Yu, <sup>603</sup> C. Zhang, <sup>589</sup> and W. Zhao <sup>618</sup>

# (GROWTH, JAGWAR, CALTECH-NRAO, TTU-NRAO AND NUSTAR COLLABORATIONS)

K. C. Chambers,  $^{620}$  M. E. Huber,  $^{620}$  A. S. B. Schultz,  $^{620}$  J. Bulger,  $^{620}$  H. Flewelling,  $^{620}$  E. A. Magnier,  $^{620}$  T. B. Lowe,  $^{620}$  R. J. Wainscoat,  $^{620}$  C. Waters,  $^{620}$  and M. Willman,  $^{620}$ 

#### (PAN-STARRS)

K. EBISAWA, <sup>621</sup> C. HANYU, <sup>622</sup> S. HARITA, <sup>623</sup> T. HASHIMOTO, <sup>624</sup> K. HIDAKA, <sup>622</sup> T. HORI, <sup>625</sup> M. ISHIKAWA, <sup>626</sup> N. ISOBE, <sup>621</sup> W. IWAKIRI, <sup>627</sup> H. KAWAI, <sup>628</sup> N. KAWAI, <sup>623</sup> T. KAWAMURO, <sup>629</sup> T. KAWASE, <sup>630</sup> Y. KITAOKA, <sup>624</sup> K. MAKISHIMA, <sup>627</sup> M. MATSUOKA, <sup>627</sup> T. MIHARA, <sup>627</sup> T. MORITA, <sup>625</sup> K. MORITA, <sup>623</sup> S. NAKAHIRA, <sup>627</sup> M. NAKAJIMA, <sup>630</sup> Y. NAKAMURA, <sup>628</sup> H. NEGORO, <sup>630</sup> S. ODA, <sup>625</sup> A. SAKAMAKI, <sup>630</sup> R. SASAKI, <sup>628</sup> M. SERINO, <sup>624</sup> M. SHIDATSU, <sup>627</sup> R. SHIMOMUKAI, <sup>621</sup> Y. SUGAWARA, <sup>621</sup> S. Sugita, <sup>623</sup> M. Sugizaki, <sup>627</sup> Y. Tachibana, <sup>623</sup> Y. Takao, <sup>627</sup> A. Tanimoto, <sup>625</sup> H. Tomida, <sup>621</sup> Y. Tsuboi, <sup>628</sup> H. Tsunemi, <sup>631</sup> Y. Ueda, <sup>625</sup> S. Ueno, <sup>621</sup> S. Yamada, <sup>625</sup> K. Yamaoka, <sup>632</sup> M. Yamauchi, <sup>622</sup> F. Yatabe, <sup>627</sup> T. Yoneyama, <sup>631</sup> and T. Yoshii <sup>623</sup>

# (THE MAXI TEAM)

D. M. COWARD,  $^{633}$  H. Crisp,  $^{633}$  D. Macpherson,  $^{635}$  I. Andreoni,  $^{634}$  R. Laugier,  $^{635}$  K. Noysena,  $^{635,636}$  A. Klotz,  $^{636}$  B. Gendre,  $^{635,637}$  P. Thierry,  $^{638}$  and D. Turpin  $^{633}$ 

# (TZAC CONSORTIUM)

M. Im,  $^{639}$  C. Choi,  $^{639}$  J. Kim,  $^{639}$  Y. Yoon,  $^{639}$  G. Lim,  $^{639}$  S.-K. Lee,  $^{639}$  C.-U. Lee,  $^{640}$  S.-L. Kim,  $^{640}$  S.-W. Ko,  $^{640}$  J. Joe,  $^{640}$  M.-K. Kwon,  $^{640}$  P.-J. Kim,  $^{640}$  S.-K. Lim,  $^{640}$  And J.-S. Choi  $^{640}$ 

#### (KU COLLABORATION)

J. P. U. FYNBO. 329 D. MALESANI. 329 AND D. XU<sup>641</sup> (NORDIC OPTICAL TELESCOPE)

S. J. Smartt,  $^{642}$  A. Jerkstrand,  $^{426}$  E. Kankare,  $^{642}$  S. A. Sim,  $^{642}$  M. Fraser,  $^{168}$  C. Inserra,  $^{643}$  K. Maguire,  $^{642}$  G. Leloudas,  $^{329}$  M. Magee,  $^{642}$  L. J. Shingles,  $^{642}$  K. W. Smith,  $^{642}$  D. R. Young,  $^{642}$  R. Kotak,  $^{642}$  A. Gal-Yam,  $^{644}$ 

J. D. Lyman, <sup>645</sup> D. S. Homan, <sup>646</sup> C. Agliozzo, <sup>647,648</sup> J. P. Anderson, <sup>649</sup> C. R. Angus, <sup>643</sup> C. Ashall, <sup>614</sup> C. Barbarino, <sup>650</sup> F. E. Bauer, <sup>651,648,652</sup> M. Berton, <sup>653,654</sup> M. T. Botticella, <sup>655</sup> M. Bulla, <sup>656</sup> G. Cannizzaro, <sup>657</sup> R. Cartier, <sup>643</sup> A. Cikota, <sup>658</sup> P. Clark, <sup>642</sup> A. De Cia, <sup>658</sup> M. Della Valle, <sup>655,659</sup> M. Dennefeld, <sup>660</sup> L. Dessart, <sup>661</sup> G. Dimitriadis, <sup>643</sup> N. Elias-Rosa, <sup>662</sup> R. E. Firth, <sup>643</sup> A. Flörs, <sup>658,426</sup> C. Frohmaier, <sup>663</sup> L. Galbany, <sup>664</sup> S. González-Gaitán, <sup>665</sup> M. Gromadzki, <sup>666</sup> C. P. Gutiérrez, <sup>643</sup> A. Hamanowicz, <sup>658,666</sup> J. Harmanen, <sup>667</sup> K. E. Heintz, <sup>548,329</sup> M.-S. Hernandez, <sup>668</sup> S. T. Hodgkin, <sup>669</sup> I. M. Hook, <sup>670</sup> L. Izzo, <sup>671</sup> P. A. James, <sup>614</sup> P. G. Jonker, <sup>657,66</sup> W. E. Kerzendorf, <sup>658</sup> Z. Kostrzewa-Rutkowska, <sup>657,66</sup> M. Kromer, <sup>672,673</sup> H. Kuncarayakti, <sup>674,667</sup> A. Lawrence, <sup>646</sup> I. Manulis, <sup>644</sup> S. Mattila, <sup>667</sup> O. McBrien, <sup>642</sup> A. Müller, <sup>675</sup> J. Nordin, <sup>676</sup> D. O'Neill, <sup>642</sup> F. Onori, <sup>657</sup> J. T. Palmerio, <sup>677</sup> A. Pastorello, <sup>678</sup> F. Patat, <sup>658</sup> G. Pignata, <sup>647,648</sup> P. Podsiadlowski, <sup>679</sup> A. Razza, <sup>649,680</sup> T. Reynolds, <sup>667</sup> R. Roy, <sup>650</sup> A. J. Ruiter, <sup>681,533,682</sup> K. A. Rybicki, <sup>666</sup> L. Salmon, <sup>168</sup> M. L. Pumo, <sup>683,678,684</sup> S. J. Prentice, <sup>614</sup> I. R. Seitenzahl, <sup>681,533</sup> M. Smith, <sup>643</sup> J. Sollerman, <sup>650</sup> M. Sullivan, <sup>643</sup> H. Szegedi, <sup>685</sup> F. Taddia, <sup>650</sup> S. Taubenberger, <sup>658,426</sup> G. Terreran, <sup>350,678</sup> B. van Soelen, <sup>685</sup> J. Vos, <sup>668</sup> N. A. Walton, <sup>669</sup> D. E. Wright, <sup>686</sup> Ł. Wyrzykowski, <sup>666</sup> and O. Yaron <sup>644</sup>

#### (EPESSTO)

T.-W. Chen,  $^{687}$  T. Krühler,  $^{687}$  P. Schady,  $^{687}$  P. Wiseman,  $^{687}$  J. Greiner,  $^{687}$  A. Rau,  $^{687}$  T. Schweyer,  $^{687}$  S. Klose,  $^{688}$  and A. Nicuesa Guelbenzu $^{688}$ 

#### (GROND)

# N. T. Palliyaguru<sup>689</sup>

(TEXAS TECH UNIVERSITY)

M. M. Shara,  $^{690,362}$  T. Williams,  $^{691}$  P. Vaisanen,  $^{691,692}$  S. B. Potter,  $^{691}$  E. Romero Colmenero,  $^{691,692}$  S. Crawford,  $^{691,692}$  D. A. H. Buckley,  $^{691}$  and J. Mao<sup>441</sup>

#### (SALT GROUP)

M. C. Díaz, <sup>693</sup> L. M. Macri, <sup>694</sup> D. García Lambas, <sup>695</sup> C. Mendes de Oliveira, <sup>696</sup> J. L. Nilo Castellón, <sup>697,698</sup> T. Ribeiro, <sup>699</sup> B. Sánchez, <sup>695</sup> W. Schoenell, <sup>696,700</sup> L. R. Abramo, <sup>701</sup> S. Akras, <sup>702</sup> J. S. Alcaniz, <sup>702</sup> R. Artola, <sup>695</sup> M. Beroiz, <sup>693</sup> S. Bonoli, <sup>703</sup> J. Cabral, <sup>695</sup> R. Camuccio, <sup>693</sup> M. Castillo, <sup>693</sup> V. Chabushyan, <sup>704</sup> P. Coelho, <sup>696</sup> C. Colazo, <sup>695</sup> M. V. Costa-Duarte, <sup>696</sup> H. Cuevas Larenas, <sup>698</sup> D. L. DePoy, <sup>694</sup> M. Domínguez Romero, <sup>695</sup> D. Dultzin, <sup>705</sup> D. Fernández, <sup>706</sup> J. García, <sup>693</sup> C. Girardini, <sup>695</sup> D. R. Gonçalves, <sup>707</sup> T. S. Gonçalves, <sup>707</sup> S. Gurovich, <sup>695</sup> Y. Jiménez-Teja, <sup>702</sup> A. Kanaan, <sup>700</sup> M. Lares, <sup>695</sup> R. Lopes de Oliveira, <sup>699,708</sup> O. López-Cruz, <sup>704</sup> J. L. Marshall, <sup>694</sup> R. Melia, <sup>695</sup> A. Molino, <sup>696</sup> N. Padilla, <sup>706</sup> T. Peñuela, <sup>693,709</sup> V. M. Placco, <sup>710,711</sup> C. Quiñones, <sup>695</sup> A. Ramírez Rivera, <sup>698</sup> V. Renzi, <sup>695</sup> L. Riguccini, <sup>707</sup> E. Ríos-Lopez, <sup>704</sup> H. Rodriguez, <sup>695</sup> L. Sampedro, <sup>696</sup> M. Schneiter, <sup>695</sup> L. Sodré, <sup>696</sup> M. Starck, <sup>695</sup> S. Torres-Flores, <sup>698</sup> M. Tornatore, <sup>695</sup> and A. Zadrożny <sup>693</sup> (TOROS: Transient Robotic Observatory of the South collaboration)

A. J. Castro-Tirado,  $^{712,713}$  J. C. Tello,  $^{712}$  Y.-D. Hu,  $^{712}$  B.-B. Zhang,  $^{712}$  R. Cunniffe,  $^{712}$  A. Castellón,  $^{714}$  D. Hiriart,  $^{715}$  M. D. Caballero-García,  $^{716}$  M. Jelínek,  $^{717}$  P. Kubánek,  $^{718}$  C. Pérez del Pulgar,  $^{713}$  I. H. Park,  $^{719}$  S. Jeong,  $^{719}$  J. M. Castro Cerón,  $^{720}$  S. B. Pandey,  $^{721}$  P. C. Yock,  $^{722}$  R. Querel,  $^{723}$  Y. Fan,  $^{724}$  and C. Wang,  $^{724}$ 

#### (THE BOOTES COLLABORATION)

A BEARDSLEY,  $^{725}$  I. S. Brown,  $^{500}$  B. Crosse,  $^{502}$  D. Emrich,  $^{502}$  T. Franzen,  $^{502}$  B. M. Gaensler,  $^{726}$  L. Horsley,  $^{502}$  M. Johnston-Hollitt,  $^{727}$  D. Kenney,  $^{502}$  M. F. Morales,  $^{728}$  D. Pallot,  $^{729}$  M. Sokolowski,  $^{502,499,730}$  K. Steele,  $^{502}$  S. J. Tingay,  $^{502,499}$  C. M. Trott,  $^{502,499}$  M. Walker,  $^{502}$  R. Wayth,  $^{502,499}$  A. Williams,  $^{502}$  and C. Wu  $^{729}$ 

# (MWA: MURCHISON WIDEFIELD ARRAY)

A. Yoshida, <sup>731</sup> T. Sakamoto, <sup>731</sup> Y. Kawakubo, <sup>731</sup> K. Yamaoka, <sup>732</sup> I. Takahashi, <sup>733</sup> Y. Asaoka, <sup>734</sup> S. Ozawa, <sup>734</sup> S. Torii, <sup>734</sup> Y. Shimizu, <sup>735</sup> T. Tamura, <sup>735</sup> W. Ishizaki, <sup>736</sup> M. L. Cherry, <sup>2</sup> S. Ricciarini, <sup>737</sup> A. V. Penacchioni, <sup>738</sup> and P. S. Marrocchesi, <sup>738</sup>

# (THE CALET COLLABORATION)

A. S. Pozanenko, $^{739,740,741}$  A. A. Volnova, $^{739}$  E. D. Mazaeva, $^{739}$  P. Yu. Minaev, $^{739}$  M. A. Krugov, $^{742}$  and A. S. Moskvitin $^{743}$ 

#### (IKI-GW FOLLOW-UP COLLABORATION)

H. ABDALLA,  $^{744}$  A. ABRAMOWSKI,  $^{745}$  F. AHARONIAN,  $^{746,747,748}$  F. AIT BENKHALI,  $^{746}$  E.O. ANGÜNER,  $^{749}$  M. ARAKAWA,  $^{750}$  M. ARRIETA,  $^{751}$  P. AUBERT,  $^{752}$  M. BACKES,  $^{753}$  A. BALZER,  $^{754}$  M. BARNARD,  $^{744}$  Y. BECHERINI,  $^{755}$  J. BECKER TJUS,  $^{756}$  D. BERGE,  $^{757}$  S. BERNHARD,  $^{758}$  K. BERNLÖHR,  $^{746}$  R. BLACKWELL,  $^{759}$  M. BÖTTCHER,  $^{744}$  C. BOISSON,  $^{751}$  J. BOLMONT,  $^{760}$  S. BONNEFOY,  $^{183}$  P. BORDAS,  $^{746}$  J. BREGEON,  $^{761}$  F. BRUN,  $^{762}$  P. BRUN,  $^{763}$  M. BRYAN,  $^{754}$  M. BÜCHELE,  $^{189}$  T. BULIK,  $^{764}$  M. CAPASSO,  $^{765}$  S. CAROFF,  $^{469}$  A. CAROSI,  $^{752}$  S. CASANOVA,  $^{749,746}$  M. CERRUTI,  $^{760}$  N. CHAKRABORTY,  $^{746}$  R. C. G. CHAVES,  $^{761}$  A. CHEN,  $^{766}$  J. CHEVALIER,  $^{752}$  S. COLAFRANCESCO,  $^{766}$  B. CONDON,  $^{762}$  J. CONRAD,  $^{767}$  I. D. DAVIDS,  $^{753}$  J. DECOCK,  $^{763}$  C. DEIL,  $^{746}$  J. DEVIN,  $^{761}$  P. DEWILT,  $^{759}$  L. DIRSON,  $^{745}$  A. DJANNATI-ATAÏ,  $^{768}$  A. DONATH,  $^{746}$  L. O'C. DRURY,  $^{747}$  K. DUTSON,  $^{769}$  J. DYKS,  $^{770}$  T. EDWARDS,  $^{746}$ 

K. EGBERTS, To G. EMERY, To J.-P. ERNENWEIN, S. ESCHBACH, S. C. FARNIER, To S. FEGAN, H. V. FERNANDES, S. A. FIASSON, S. G. FONTAINE, S. F. F. M. FÜSSLING, S. G. GABICI, S. A. GALLANT, S. FEGAN, S. FEGAN, F. GATÉ, S. G. GIAVITTO, S. B. GIEBELS, S. F. D. GLAWION, S. J. F. GLICENSTEIN, S. G. D. GOTTSCHALL, S. M.-H. GRONDIN, S. J. HAHN, S. G. HENRI, S. G. HERMANN, S. M. J. A. HINTON, S. G. J. A. JACHOLKOWSKA, S. G. HOISCHEN, S. J. L. HOLCH, S. G. HENRI, S. G. HERMANN, S. G. HERMANN, S. G. HERMANN, S. G. HERMANN, S. M. JAMROZY, S. G. J. A. JACHOLKOWSKA, S. G. HERMANN, S. M. JAMROZY, S. M. JANKOWSKY, S. M. JINGO, S. G. L. JOUVIN, S. J. JUNG-RICHARDT, S. M. A. KASTENDIECK, S. K. KATARZYŃSKI, S. T. M. KATSURAGAWA, S. S. KRAKAU, S. M. JINGO, S. G. L. JOUVIN, S. J. KING, S. KLEPSER, S. M. A. KASTENDIECK, S. K. KATARZYŃSKI, S. M. KATARZYŃSKI, S. M. KOSACK, S. KRAKAU, S. KRAKAU, S. M. KRAUS, S. M. LIU, S. G. MAURIN, S. M. LEMOIRS, S. M. LEMOIRS, S. M. LIU, S. G. MAURIN, S. M. M. M. MITCHELL, S. G. MAURIN, S. MAKASHIMA, S. M K. EGBERTS, 771 G. EMERY, 760 J.-P. ERNENWEIN, 772 S. ESCHBACH, 189 C. FARNIER, 767, 755 S. FEGAN, 469 M.V. FERNANDES, 745 

### (H.E.S.S. COLLABORATION)

R. P. Fender, 782 J. W. Broderick, 543,66 A. Rowlinson, 783,543 R. A. M. J. Wijers, 783 A. J. Stewart, 782 S. Ter Veen, 543 and A. SHULEVSKI<sup>543</sup>

# (LOFAR COLLABORATION)

M. Kavic,  $^{784}$  J. H. Simonetti,  $^{785}$  C. League,  $^{784}$  J. Tsai,  $^{785}$  K. S. Obenberger,  $^{786}$  K. Nathaniel,  $^{785}$  G. B. Taylor,  $^{787}$  J. D. Dowell,  $^{787}$  S. L. Liebling,  $^{788}$  J. A. Estes,  $^{784}$  M. Lippert,  $^{784}$  I. Sharma,  $^{784}$  P. Vincent,  $^{784}$  and B. Farella,  $^{784}$ (LWA: LONG WAVELENGTH ARRAY)

A. U. ABEYSEKARA, 789 A. ALBERT, 790 R. ALFARO, 791 C. ALVAREZ, 792 R. ARCEO, 792 J. C. ARTEAGA-VELÁZQUEZ, 793 D. AVILA ROJAS, <sup>791</sup> H. A. AYALA SOLARES, <sup>794</sup> A. S. BARBER, <sup>789</sup> J. BECERRA GONZALEZ, <sup>50</sup> A. BECERRIL, <sup>791</sup> E. BELMONT-MORENO, <sup>791</sup> S. Y. BENZVI, <sup>795</sup> D. BERLEY, <sup>796</sup> A. BERNAL, <sup>797</sup> J. BRAUN, <sup>798</sup> C. BRISBOIS, <sup>794</sup> A. S. BERNAL, <sup>797</sup> J. BRAUN, <sup>798</sup> C. BRISBOIS, <sup>794</sup> A. BERNAL, <sup>797</sup> J. BRAUN, <sup>798</sup> C. BRISBOIS, <sup>794</sup> A. BERNAL, <sup>797</sup> J. BRAUN, <sup>798</sup> C. BRISBOIS, <sup>794</sup> A. S. BERNAL, <sup>798</sup> D. BERLEY, <sup>796</sup> A. BERNAL, <sup>797</sup> J. BRAUN, <sup>798</sup> C. BRISBOIS, <sup>794</sup> A. S. BERNAL, <sup>798</sup> D. BERLEY, <sup>798</sup> A. BERNAL, <sup>797</sup> J. BRAUN, <sup>798</sup> C. BRISBOIS, <sup>794</sup> A. S. BERNAL, <sup>798</sup> D. BERLEY, <sup>798</sup> A. BERNAL, <sup>799</sup> J. BRAUN, <sup>798</sup> C. BRISBOIS, <sup>794</sup> A. S. BERNAL, <sup>798</sup> D. BERLEY, <sup>798</sup> A. BERNAL, <sup>798</sup> J. BERNAL, <sup>798</sup> D. BERLEY, <sup>798</sup> A. BERNAL, <sup>799</sup> J. BRAUN, <sup>798</sup> C. BRISBOIS, <sup>794</sup> A. S. BARNAL, <sup>798</sup> D. BERLEY, <sup>798</sup> A. BERNAL, <sup>798</sup> J. BRAUN, <sup>798</sup> C. BRISBOIS, <sup>794</sup> A. S. BRAUN, <sup>798</sup> C. BRISBOIS, <sup>794</sup> A. S. BARNAL, <sup>798</sup> D. BERLEY, <sup>798</sup> A. BERNAL, <sup>799</sup> J. BRAUN, <sup>798</sup> C. BRISBOIS, <sup>794</sup> A. S. BARNAL, <sup>798</sup> D. BERLEY, <sup>798</sup> A. BERNAL, <sup>799</sup> J. BRAUN, <sup>798</sup> C. BRISBOIS, <sup>794</sup> A. S. BARNAL, <sup>798</sup> D. BERLEY, <sup>798</sup> A. BERNAL, <sup>798</sup> J. BRAUN, <sup>798</sup> C. BRISBOIS, <sup>798</sup> A. BERNAL, <sup>798</sup> A. S. BARNAL, <sup>798</sup> D. BERLEY, <sup>798</sup> A. BERNAL, <sup>799</sup> J. BRAUN, <sup>798</sup> C. BRISBOIS, <sup>798</sup> A. BERNAL, <sup>798</sup> A. S. BARNAL, <sup></sup> E. BELMONT-MORENO, <sup>791</sup> S. Y. BENZVI, <sup>795</sup> D. BERLEY, <sup>796</sup> A. BERNAL, <sup>797</sup> J. BRAUN, <sup>798</sup> C. BRISBOIS, <sup>794</sup>
K. S. CABALLERO-MORA, <sup>792</sup> T. CAPISTRÁN, <sup>799</sup> A. CARRAMIÑANA, <sup>799</sup> S. CASANOVA, <sup>800</sup> M. CASTILLO, <sup>793</sup> U. COTTI, <sup>793</sup>
J. COTZOMI, <sup>801</sup> S. COUTIÑO DE LEÓN, <sup>799</sup> C. DE LEÓN, <sup>801</sup> E. DE LA FUENTE, <sup>802</sup> R. DIAZ HERNANDEZ, <sup>799</sup> S. DICHIARA, <sup>797</sup>
B. L. DINGUS, <sup>790</sup> M. A. DUVERNOIS, <sup>798</sup> J. C. DÍAZ-VÉLEZ, <sup>802, 798</sup> R. W. ELLSWORTH, <sup>803</sup> K. ENGEL, <sup>796</sup> O. ENRÍQUEZ-RIVERA, <sup>804</sup>
D. W. FIORINO, <sup>796</sup> H. FLEISCHHACK, <sup>794</sup> N. FRAIJA, <sup>797</sup> J. A. GARCÍA-GONZÁLEZ, <sup>791</sup> F. GARFIAS, <sup>797</sup> M. GERHARDT, <sup>794</sup>
A. GONZÁLEZ MUÑOZ, <sup>791</sup> M. M. GONZÁLEZ, <sup>797</sup> J. A. GOODMAN, <sup>796</sup> Z. HAMPEL-ARIAS, <sup>798</sup> J. P. HARDING, <sup>790</sup> S. HERNANDEZ, <sup>791</sup>
A. HERNANDEZ-ALMADA, <sup>791</sup> B. HONA, <sup>794</sup> P. HÜNTEMEYER, <sup>794</sup> A. IRIARTE, <sup>797</sup> A. JARDIN-BLICQ, <sup>805</sup> V. JOSHI, <sup>805</sup> S. KAUFMANN, <sup>792</sup>
D. KIEDA, <sup>789</sup> A. LARA, <sup>804</sup> R. J. LAUER, <sup>806</sup> D. LENNARZ, <sup>807</sup> H. LEÓN VARGAS, <sup>791</sup> J. T. LINNEMANN, <sup>808</sup> A. L. LONGINOTTI, <sup>799</sup>
G. LUIS RAYA, <sup>809</sup> R. LUNA-GARCÍA, <sup>810</sup> R. LÓPEZ-COTO, <sup>805</sup> K. MALONE, <sup>811</sup> S. S. MARINELLI, <sup>808</sup> O. MARTINEZ, <sup>801</sup>
I. MARTINEZ-CASTELLANOS, <sup>796</sup> J. MARTÍNEZ-CASTRO, <sup>810</sup> H. MARTÍNEZ-HUERTA, <sup>812</sup> J. A. MATTHEWS, <sup>806</sup>
P. MIRANDA-ROMAGNOLI, <sup>813</sup> E. MORENO, <sup>801</sup> M. MOSTAFÁ, <sup>811</sup> L. NELLEN, <sup>814</sup> M. NEWBOLD, <sup>789</sup> M. U. NISA, <sup>795</sup>
D. ROSA-GONZÁLEZ, <sup>799</sup> M. ROSENBERG, <sup>811</sup> E. RUIZ-VELASCO, <sup>791</sup> H. SALAZAR, <sup>801</sup> F. SALESA GREUS, <sup>800</sup> A. SANDOVAL, <sup>791</sup>
M. SCHNEIGER, <sup>815</sup> H. SCHOORLEMMER, <sup>805</sup> G. SINNIS, <sup>790</sup> A. J. SMITH, <sup>796</sup> R. W. SPRINGER, <sup>789</sup> P. SURAJBALI, <sup>805</sup> O. TIBOLLA, <sup>792</sup>
K. TOLLEFSON, <sup>808</sup> I. TORRES, <sup>799</sup> T. N. UKWATTA, <sup>790</sup> T. WEISGARBER, <sup>798</sup> S. WESTERHOFF, <sup>798</sup> I. G. WISHER, <sup>798</sup> J. WOOD, <sup>798</sup>
T. YAPICI, <sup>808</sup> G. B. YODH, <sup>816</sup> P. W. YOUNK, <sup>790</sup> H. ZHOU, <sup>790</sup> AND J. D. ÁLVAREZ<sup>793</sup>

#### (HAWC COLLABORATION)

A. AAB,  $^{66}$  P. Abreu,  $^{817}$  M. Aglietta,  $^{818,819}$  I. F. M. Albuquerque,  $^{820}$  J. M. Albury,  $^{821}$  I. Allekotte,  $^{822}$  A. Almela,  $^{823,824}$  J. Alvarez Castillo,  $^{825}$  J. Alvarez-Muñiz,  $^{826}$  G. A. Anastasi,  $^{827,828}$  L. Anchordoqui,  $^{829}$  B. Andrada,  $^{823}$  S. Andringa,  $^{817}$ 

C. Aramo, 830 N. Arsene, 831 H. Asorey, 822, 832 P. Assis, 817 G. Avila, 833, 834 A. M. Badescu, 835 A. Balaceanu, 836 F. Barbato, 837 R. J. Barreira Luz, 817 K. H. Becker, 206 J. A. Bellido, 821 C. Berat, 838 M. E. Bertaina, 839, 819 X. Bertou, 822 P. L. Biermann, 840 J. Biteau, 841 S. G. Blaess, 821 A. Blanco, 817 J. Blazek, 842 C. Bleve, 843, 844 M. Boháčová, 842 C. Bonifazi, 845 N. Borodai, 846 A. M. Botti, 823, 847 J. Brack, 848 I. Brancus, 836 T. Bretz, 849 A. Bridgeman, 850 F. L. Briechle, 849 P. Buchholz, 851 A. Bueno, 852 S. Buitink, 66 M. Buscemi, 853, 854 K. S. Caballero-Mora, 792 L. Caccianiga, 855 A. Cancio, 824, 823 F. Canfora, 66, 14 R. Caruso, 853, 854 A. Castellina, 818, 819 F. Catalani, 856 G. Cataldi, 844 L. CACCIANIGA, SA. CANCIO, SCANCIO, SCA M. L. DÍAZ CASTRO, 858 F. DIOGO, 817 C. DOBRIGKEIT, 858 J. C. D'OLIVO, 825 Q. DOROSTI, 851 R. C. DOS ANJOS, 871 M. T. DOVA, 872 A. DUNDOVIC, 873 J. EBR, 842 R. ENGEL, 847 M. ERDMANN, 849 M. ERFANI, 851 C. O. ESCOBAR, 874 J. ESPADANAL, 817 A. ETCHEGOYEN, 823, 824 H. FALCKE, 66, 875, 14 J. FARMER, 864 G. FARRAR, 876 A. C. FAUTH, 858 N. FAZZINI, 874 F. FELDBUSCH, 877 F. FENU, 839, 819 B. FICK, 878 J. M. FIGUEIRA, 823 A. FILIPČIČ, 879, 495 M. M. FREIRE, 880 T. FUJII, 864 A. FUSTER, 823, 824 R. GAÏOR, 881 B. GARCÍA, 859 F. GATÉ, 882 H. GEMMEKE, 877 A. GHERGHEL-LASCU, 836 P.L. GHIA, 841 U. GIACCARI, 845, 883 M. GIAMMARCHI, 861 M. GILLER, 884 D. GŁAS, 885 C. GLASER, 849 G. GOLUP, 822 M. GÓMEZ BERISSO, 822 P. F. GÓMEZ VITALE, 833, 834 N. GONZÁLEZ, 823, 847 A. GORGI, 818, 819 M. GOTTOWIK, 206 A. F. GRILLO, 828, \* T. D. GRUBB, 821 F. GUARINO, 837, 830 G. P. GUEDES, 886 R. HALLIDAY, 863 M. R. HAMPEL, 823 P. HANSEN, 872 D. HARARI, 822 T. A. HARRISON, 821 V. M. HARVEY, 821 A. HAUNGS, 847 T. HEBBEKER, 849 D. HECK, 847 P. HEIMANN, 851 A. E. HERVE, 850 G. C. HILL, 821 C. HOJVAT, 874 E. W. HOLT, 847, 823 P. HOMOLA, 846 J. R. HÖRANDEL, 66, 14 P. HORVATH, 887 M. HRABOVSKÝ, 887 T. HUEGE, 847 J. HULSMAN, 823, 847 A. INSOLIA, 853, 854 P. G. ISAR, 831 I. JANDT, 206 J. A. JOHNSEN, 888 M. JOSEBACHUILI, 823 J. JURYSEK, 842 A. KÄÄPÄ, 206 K. H. KAMPERT, 206 B. KEILHAUER, 847 N. KEMMERICH, 820 J. KEMP, 849 R. M. KIECKHAFER, 878 H. O. KLAGES, 847 M. KLEIFGES, 877 J. KLEINFELLER, 833 R. KRAUSE, 849 N. KROHM, 206 D. KUEMPEL, 206 G. KUKEC MEZEK, 495 N. KUNKA, 877 A. KUOTB AWAD, 850 B. L. LAGO, 889 D. LAHURD, 863 R.G. LANG, 870 M. LAUSCHER, 849 R. LEGUMINA, 884 M. A. LEIGUI DE OLIVEIRA, 890 A. LETESSIER-SELVON, 881 I. LHENRY-YVON, 841 K. LINK, 850 M. L. DÍAZ CASTRO, 858 F. DIOGO, 817 C. DOBRIGKEIT, 858 J. C. D'OLIVO, 825 Q. DOROSTI, 851 R. C. DOS ANJOS, 871 M. T. DOVA, 872 D. KUEMPEL, 206 G. KUKEC MEZEK, 495 N. KUNKA, 877 A. KUOTB AWAD, 850 B. L. LAGO, 889 D. LAHURD, 863 R.G. LANG, 870 M. LAUSCHER, 849 R. LEGUMINA, 884 M. A. LEIGUI DE OLIVEIRA, 890 A. LETESSIER-SELVON, 881 I. LHENRY-YVON, 841 K. LINK, 850 D. LO PRESTI, 853, 854 L. LOPES, 817 R. LÓPEZ, 891 A. LÓPEZ CASADO, 826 R. LOREK, 863 Q. LUCE, 841 A. LUCERO, 823 M. MALACARI, 864 M. MALLAMACI, 855, 861 D. MANDAT, 842 P. MANTSCH, 874 A. G. MARIAZZI, 872 I. C. MARIŞ, 892 G. MARSELLA, 843, 844 D. MARTELLO, 843, 844 H. MARTINEZ, 893 O. MARTÍNEZ BRAVO, 891 J. J. MASÍAS MEZA, 867 H. J. MATHES, 847 S. MATHYS, 206 J. MATTHEWS, 2 G. MATTHIAE, 894, 895 E. MAYOTTE, 206 P. O. MAZUR, 874 C. MEDINA, 888 G. MEDINA-TANCO, 825 D. MELO, 823 A. MENSHIKOV, 877 K.-D. MERENDA, 888 S. MICHAL, 887 M. I. MICHELETTI, 880 L. MIDDENDORF, 849 L. MIRAMONTI, 855, 861 B. MITRICA, 836 D. MOCKLER, 850 S. MOLLERACH, 822 F. MONTANET, 838 C. MOELLO, 818, 819 G. MORLINO, 827, 828 A. L. MÜLLER, 823, 847 G. MÜLLER, 849 M. A. MULLER, 858, 896 S. MÜLLER, 850, 823 R. MUSSA, 819 I. NARANJO, 822 P. H. NGUYEN, 821 M. NICHELEGE, 801 D. NICE, 837 V. NOSEK, 897 V. NOS M. Niculescu-Oglinzanu, <sup>836</sup> M. Niechciol, <sup>851</sup> L. Niemietz, <sup>206</sup> T. Niggemann, <sup>849</sup> D. Nitz, <sup>878</sup> D. Nosek, <sup>897</sup> V. Novotny, <sup>897</sup> L. Nožka, <sup>887</sup> L. A. Núñez, <sup>832</sup> F. Oikonomou, <sup>860</sup> A. Olinto, <sup>864</sup> M. Palatka, <sup>842</sup> J. Pallotta, <sup>898</sup> P. Papenbreer, <sup>206</sup> G. Parente, <sup>826</sup> A. Parra, <sup>891</sup> T. Paul, <sup>829</sup> M. Pech, <sup>842</sup> F. Pedreira, <sup>826</sup> J. Pękala, <sup>846</sup> J. Peña-Rodriguez, <sup>832</sup> L. A. S. Pereira, <sup>858</sup> M. Perlin, <sup>823</sup> L. Perrone, <sup>843</sup>, <sup>844</sup> C. Peters, <sup>849</sup> S. Petrera, <sup>827</sup>, <sup>828</sup> J. Phuntsok, <sup>860</sup> T. Pierog, <sup>847</sup> M. Pimenta, <sup>817</sup> V. Pirronello, <sup>853</sup>, <sup>854</sup> M. Platino, <sup>823</sup> M. Plum, <sup>849</sup> J. Poh, <sup>864</sup> C. Porowski, <sup>846</sup> R. R. Prado, <sup>870</sup> P. Privitera, <sup>864</sup> M. Prouza, <sup>842</sup> E. J. Quel, <sup>898</sup> S. Querchfeld, <sup>206</sup> S. Quinn, <sup>863</sup> R. Ramos-Pollan, <sup>832</sup> J. Rautenberg, <sup>206</sup> D. Ravignani, <sup>823</sup> J. Ridky, <sup>842</sup> F. Riehn, <sup>817</sup> M. Risse, <sup>851</sup> P. Ristori, <sup>898</sup> V. Rizi, <sup>899,828</sup> W. Rodrigues de Carvalho, <sup>820</sup> G. Rodriguez Fernandez, <sup>894,895</sup> J. Rodriguez Rojo, <sup>833</sup> M. J. Roncoroni, <sup>823</sup> M. Roth, <sup>847</sup> E. Roulet, <sup>822</sup> A. C. Rovero, <sup>866</sup> P. Ruehl, <sup>851</sup> S. J. Saffi, <sup>821</sup> A. Saftoiu, <sup>836</sup> F. Salamida, <sup>899,828</sup> H. Salazar, <sup>891</sup> A. Saleh, <sup>495</sup> G. Salina, <sup>895</sup> F. Sánchez, <sup>823</sup> P. Sanchez-Lucas, <sup>852</sup> E. M. Santos, <sup>820</sup> E. Santos, <sup>842</sup> F. Sarazin, <sup>888</sup> R. Sarmento, <sup>817</sup> C. Sarmiento-Cano, <sup>823</sup> R. Sato, <sup>833</sup> M. Schauer, <sup>206</sup> V. Scherini, <sup>844</sup> H. Schieler, <sup>847</sup> M. Schimp, <sup>206</sup> D. Schmidt, <sup>847,823</sup> O. Scholten, <sup>900,901</sup> P. Schovánek, <sup>842</sup> F. G. Schröder, <sup>847</sup> S. Schröder, <sup>206</sup> J. Schumacher, <sup>849</sup> S. J. Sciutto, <sup>872</sup> A. Segreto, <sup>902,854</sup> A. Shadkam, <sup>2</sup> R. C. Shellard, <sup>883</sup> G. Sigl, <sup>873</sup> G. Shada, <sup>834</sup> P. Šván, <sup>845</sup> P. Šván, <sup>847</sup> P. Šván, <sup>847</sup> P. Šván, <sup>848</sup> P. Šván, <sup>849</sup> S. J. Schumacher, <sup>860</sup> S. Schumacher, <sup>851</sup> L. F. Sanda, <sup>829</sup> P. Sanchez, <sup>838</sup> G. Sigl, <sup>873</sup> P. Šván, <sup>847</sup> P. Šván, <sup>848</sup> P. Šván, <sup>848</sup> P. Šván, <sup>848</sup> P. Šván, <sup>849</sup> P. Šván, <sup>848</sup> P. Šván, S. Schröder, 206 J. Schumacher, 849 S. J. Sciutto, 872 A. Segreto, 902, 854 A. Shadkam, R. C. Shellard, 853 G. Sigl, 873 G. Sigl, 823, 847 R. Šmída, 847 G. R. Snow, 903 P. Sommers, 860 S. Sonntag, 851 J. F. Soriano, 829 R. Squartini, 833 D. Stanca, 836 S. Stanič, 495 J. Stasielak, 846 P. Stassi, 838 M. Stolpovskiy, 838 F. Strafella, 843, 844 A. Streich, 850 F. Suarez, 823, 824 M. Suarez-Durán, 832 T. Sudholz, 821 T. Suomijärvi, 841 A. D. Supanitsky, 866 J. Šupík, 887 J. Swain, 904 Z. Szadkowski, 885 A. Taboada, 847 O. A. Taborda, 822 C. Timmermans, 14, 66 C. J. Todero Peixoto, 856 L. Tomankova, 847 B. Tomé, 817 G. Torralba Elipe, 826 P. Travnicek, 842 M. Trini, 495 M. Tueros, 872 R. Ulrich, 847 M. Unger, 847 M. Urban, 849 J. F. Valdés Galicia, 825 I. Valíño, 826 L. Valore, 837, 830 G. van Aar, 66 P. van Bodegom, 821 A. M. van den Berg, 900 A. van Vliet, 66 E. Varela, 891 B. Vargas Cárdenas, 825 R. A. Vázquez, 826 D. Veberič, 847 C. Ventura, 869 I. D. Vergara Quispe, 872 V. Verzi, 895 J. Vicha, 842 L. Villaseñor, 857 S. Vorobiov, 495 H. Wahlberg, 872 O. Wainberg, 823, 824 D. Walz, 849 A. A. Watson, 905 M. Weder, 873 A. Weindi, 847 M. Wieder, 888 H. Wilczyński, 846 M. Wietz, 849 M. Wietz, 849 M. Wieder, 888 H. Wilczyński, 846 M. Wietz, 849 M. Wietz, 849 M. Wietz, 846 M. Wietz, 848 M. Wilczyński, 846 M. Wietz, 849 M. Wietz, 848 M. Wilczyński, 846 M. Wietz, 849 M. Wietz, 848 M. Wilczyński, 846 M. Wietz, 849 M. Wietz, 849 M. Wietz, 848 M. Wilczyński, 846 M. Wietz, 849 M. Wietz, 848 M. Wietz, 848 M. Wietz, 849 M. Wietz, 849 M. Wietz, 849 M. Wietz, 848 M. Wietz, 848 M. Wietz, 849 M. Wietz, 844 M. Wietz, 844 M. Wietz, 844 M. Wietz, 844 M. Wietz, 845 M. Wietz, 844 M. Wietz, 844 M. Wietz, 844 M. Wietz, 844 M. Wietz, 845 M. Wietz, 844 M. Wietz, 845 M. Wietz, 845 M. Wietz, 84 D. Walz, september 1. Wallser, v. Verzi, J. Vicha, E. Villasenok, S. Vorobiov, H. Wallberg, O. Wainberg, D. Walz, september 2. Walz, september 3. Weindl, september 3. Vorobiov, H. Wallberg, O. Wainberg, September 3. Wainberg, S. Vorobiov, H. Wallberg, O. Wainberg, September 3. Wainberg, September 3. Weindl, september 3. Wainberg, S. Vorobiov, H. Wallberg, O. Wainberg, September 3. Wainberg, September 3. Wainberg, S. Vorobiov, H. Wallberg, O. Wainberg, September 3. Wallberg, S. Vorobiov, H. Wallberg, O. Wainberg, September 3. Wallberg, S. Vorobiov, H. Wallberg, O. Wainberg, September 3. Wallberg, S. Vorobiov, H. Wallberg, O. Wainberg, S. Vorobiov, H. Wallberg, O. Wainberg, September 3. Wallberg, S. Vorobiov, H. Wallberg, O. Wainberg, September 3. Wallberg, S. Vorobiov, H. Wallberg, H. Wallberg, S. Vorobiov, H. Wallberg, S. Vorobiov, H. Wallberg, H. Wal

(THE PIERRE AUGER COLLABORATION)

S. Kim,  $^{907,550}$  S. Schulze,  $^{908}$  F. E. Bauer,  $^{907,909,652}$  J. M. Corral-Santana,  $^{910}$  I. de Gregorio-Monsalvo,  $^{910,911}$  J. González-López,  $^{907}$  D. H. Hartmann,  $^{912}$  C. H. Ishwara-Chandra,  $^{913}$  S. Martín,  $^{910,911}$  A. Mehner,  $^{910}$  K. Misra,  $^{914}$  M. J. Michałowski,  $^{915}$  and L. Resmi $^{916}$ 

(ALMA COLLABORATION)

Z. Paragi,  $^{917}$  I. Agudo,  $^{918}$  T. An,  $^{919,920}$  R. Beswick,  $^{921}$  C. Casadio,  $^{922}$  S. Frey,  $^{923}$  P. Jonker,  $^{924,66}$  M. Kettenis,  $^{917}$  B. Marcote,  $^{917}$  J. Moldon,  $^{921}$  A. Szomoru,  $^{917}$  H. J. Langevelde,  $^{917,925}$  and J. Yang  $^{926}$  (Euro VLBI team)

A. CWIEK, 730 M. CWIOK, 927 H. CZYRKOWSKI, 927 R. DABROWSKI, 927 G. KASPROWICZ, 928 L. MANKIEWICZ, 929 K. NAWROCKI, 730 R. OPIELA, 929 L. W. PIOTROWSKI, 930 G. WROCHNA, 730 A. ZADROZNY, 730 M. ZAREMBA, 927 AND A. F. ŻARNECKI 927 (PI OF THE SKY COLLABORATION)

D. HAGGARD, 931 M. NYNKA, 931 AND J. J. RUAN 931 (THE CHANDRA TEAM AT MCGILL UNIVERSITY)

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