



ANNUAL STATISTICS
2020



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Personnel 2020

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Prof. Dr. R. Genzel, Infrared and Submillimeter Astronomy, also Prof. of Physics, University of California, Berkeley (USA)

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Prof. Dr. K. Pinkau (emeritus)

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Prof. Dr. T. de Zeeuw, Leiden Observatory (The Netherlands), MPE Senior Associate Scientist

Curators (together with the MPI for Astrophysics)

Prof. Dr. A. Bode, Leibniz Supercomputing Centre of the Bavarian Academy of Science and Humanities, Garching

Dr. R. Breuer, former Editor-in-Chief of 'Spektrum der Wissenschaft', Heidelberg

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Scientific Honours, Appointments

de Zeeuw, T.: Legacy Fellow of the American Astronomical Society, Washington, USA, February 2020.

Tacconi, L.: Foreign Member of the Royal Swedish Academy of Sciences, Class for Astronomy and Space Science, Stockholm, Sweden, September 2020.

Trümper, J.: Honorary member of German Physical Society DPG, Bad Honnef, Germany, September 2020.

Genzel, R.: Nobel Prize for Physics 2020, Royal Swedish Academy, Stockholm, Sweden, October 2020.

Genzel, R.: Pontifical Academy of Sciences, Vatican City, October 2020.

Bulbul, E.: ERC Consolidator Grant, European Research Council ERC, Brussels, Belgium, December 2020.

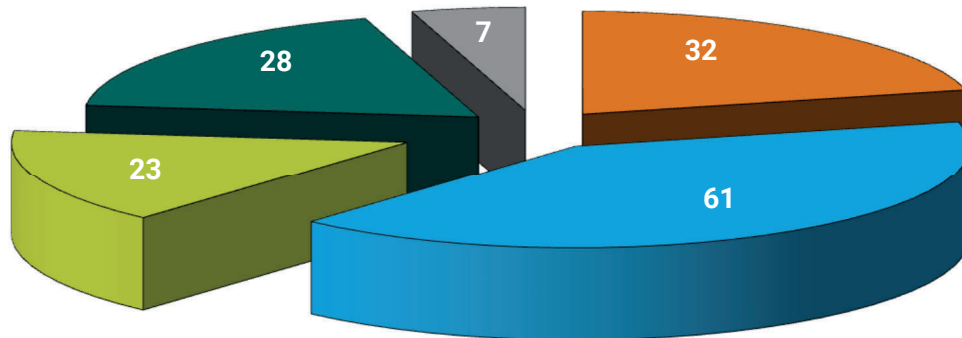
Tacconi, L.: ALMA Board Chair, ALMA, Santiago, Chile, December 2020.

Tacconi, L.: ESO Council President, ESO, Garching, Germany, December 2020.

van Dishoeck, E.: Jules Janssen Prize 2020, French Astronomical Society, Paris, France, December 2020.

Science Groups

Staff Members by Science Group



■ Infrared
 ■ HE-Astrophysics
 ■ CAS
 ■ OPINAS
 ■ Research Groups

Infrared and Submillimeter Astronomy

Secretary: Richter, A.

Team Assistants: Dengler, S.; Kleiser, A.; Zanker-Smith, J.

Bauböck, Dr. M.; Biondi, Dr. F. (since 01.10.); Coogan, Dr. R.; Cortés, Dr. A. (until 31.03.); Cridland, Dr. A. (since 15.10.); Dallilar, Dr. Y.; Davies, Dr. R.; Eisenhauer, Dr. F.; Feuchtgruber, Dipl.-Phys. H.; Förster Schreiber, Dr. N.; Gao, Dr. F. (until 01.12.); Gilllesen, Dr. S.; Habibi, Dr. M.; Hu, Dr. C.-Y.; Kravchenko, Dr. K. (since 01.10.); Lee, Dr. M.; Liu, Dr. D. (since 02.11.); Lutz, Dr. D.; More, N. (since 11.03.); Ott, Dr. T.; Poglitsch, Dr. A. (on leave); Price, Dr. S.; Rabien, Dr. S.; Schrubba, Dr. A.; Senol, Dr. Y. (since 01.11.); Shangguan, Dr. J.; Shimizu, Dr. T.; Stadler, Dr. J.; Straub, Dr. O.; Sturm, Dr. E.; Tacconi, Dr. L.; Übler, Dr. H.

Guests

Netzer, Prof. H. (14.02.-18.02.); Nestor, A. (24.02.-28.02.); Bispas, Dr. T. (24.02.-28.02.); Renzini, Prof. A. (20.07.-24.07.); Riccardi, Dr. A. (10.08.-13.08./16.09.-18.09./22.09.-25.09./07.10.-08.10.); Grani, Dr. P. (10.08.-13.08./16.09.-18.09./22.09.-25.09.); Carbonaro, L. (10.08.-13.08./16.09.-18.09./22.09.-25.09./30.09.-02.10.); Contursi, Dr. A.; van Dishoeck, Prof. E.; Sternberg, Prof. A.; de Zeeuw, Prof. T.

PhD (D.) / Master (M.)

Bolzer, M.-L. (since 02.11., M., Eisenhauer); Worth-Davies, R. (until 31.10., D., Tacconi/Förster-Schreiber/Genzel); Drescher, A. (since 01.05., M., Eisenhauer); Fellenberg

von, S. (D., Eisenhauer/Gilllesen); Jiménez Rosales, A. (until 31.10., D., Dexter/Genzel); Kaltenbrunner, D. (since 01.07., M., Shimizu); Lee, L. Y.-L. (since 01.11., D., Tacconi, Förster-Schreiber); Widmann, F. (D., Eisenhauer), Wölfer, L. (D., van Dishoeck); Young, A. (since 09.11., M. Gilllesen)

High-Energy Astrophysics

Secretary: Boller, B.

Team Assistant: Frankenhuizen, W.

Andritschke, Dr. R.; Becker, Dr. W.; Begue, Dr. D. (until 30.06.); Behrens, Dr. A.; Beitler, C. (since 01.10.); Boller, Prof. Dr. Th.; Bonholzer, M.; Bradshaw, Dr. M.; Brunner, Dr. H.; Buchner, Dr. J.); Bulbul, Dr. E.; Burgess, Dr. M.J.; Burkert, Dr. W.; Buron, A.; Burwitz, Dr. V.; Carpano, Dr. S.; Chen, Dr. J. (until 30.11.); Collmar, Dr. W. (until 30.06.); Dennerl, Dr. K.; Eraerds, Dr. T.; Eder, Dipl.-Ing. J.; Emberger, V.; Frank, J.; Freyberg, Dr. M.; Friedrich, Dr. P.; Friedrich, Dr. S.; Gaida, R.; Gatuzz, Dr. E.; Ghirardini, Dr. V.; Gueguen, Dr. A.; Greiner, Dr. J.; Haberl, Dr. F.; Hartmann, K.; Hartner, Dipl.-Math. G.; Haase, Dr. J.; Hauser, G.; Keil, Dr. I.; Kienlin von, Dr. A.; Klein, Dr. M.; Koch, A.; Liu, Dr. A. (since 19.08.); Liu, Dr. T.; Liu, Dr. Z. (since 04.08.); Maitra, Dr. Ch.; Meidinger, Dr. N.; Merloni, Dr. A.; Müller-Seidlitz, Dr. J.; Osterhage, Dr. S.; Ott, S.; Pfeffermann, Dipl.-Phys. E.; Predehl, Dr. P.; Ramos Ceja, Dr. M.; Rau, Dr. A.; Reiffers, Dr. J.; Rukdee, Dr. S. (since 01.12.); Salvato, Dr. M.; Sanders, Dr. J.; Stehlikova, V.; Stewart, Dr. I.; Thi, Dr. W.-F.; Tsvetkova, Dr. A. (since 01.10.); Yazici, Dr. S. (until 30.11.); Zhang, Dr. X.-L.

Guests

Bräuninger, Dr. H.; Collmar, Dr. W. (since 01.07.); Diehl, Dr. R.; Oti, Dr. N. (11.02-14.02.); Strong, Dr. A.; Schröder Dr. A. (since 23.11.); Tsvetkova, Dr. A. (19.01.-01.02.); Vuliv, Dr. N. (12.02.-19.02.)

PhD (D.) / Master (M.)

Arcodia, R. (D., Merloni); Bahar, E. (since 23.09., D., Bulbul); Baronchelli, L. (until 31.08., D., Nandra); Beitler, C. (until 30.09., D., Meidinger); Berlato, F. (D., Greiner); Biltzinger, B. (D., Greiner); Bogensberger, D. (D., Nandra); Chitham, I. J. (D., Finoguenov); Coffey, D. (D., Salvato/ Boller); Fresco, A. (D., Merloni); Grau, M. (since 03.08., M., Salvato); Grotova, I. (07.09., D., A. Rau); Kaefer, F. (until 30.11., D., Finoguenov); Kuhn, M. (since 01.07., M., Greiner); Malyali, A. (D., Rau); Mayer, M. (D., Becker); Pawar, A. (since 01.11., M., Greiner); Pleintinger, M. (D., Diehl), Scheck, D. (since 15.10., M., Sanders); Seppi, R. (D., Comparat); Trost, M. (since 01.04., M., Greiner); Waddell, S. (since 03.09., D., Nandra, Boller); Weinberger, C. (D., Diehl); Wolf, J. (D., Salvato); Zheng, X. (since 18.9., D. Ponti)

Optical and Interpretative Astronomy

Secretary: Ingram, C.

Bodendorf, Dr. C.; Böhringer, Prof. Dr. H.; Bohnet, Dipl. Phys. A.; Escartin, J.; Fabricius, Dr. M.; Farrow, Dr. M.; Gajda, Dr. G.; Gerhard, Prof. Dr. O.; Gracia Carpio, Dr. J.; Grupp, Dr. F.; Guglielmo, Dr. V. (until 30.09.); Haeuser, Dr. M.; Hopp, Dr. U.; Katterloher, Dr. R.; Kluge, Dr. M.; Paech, Dr. K.; Parikh, Dr. T.; Pezzotta, Dr. A. (since 01.03.); Rai-son, Dr. F.; Saglia, PD. Dr. R.; Sanchez, Dr. A.; Snigula, Dr. J.; Steinwagner, Dr. J.; Subramanian, Dr. S. (since 01.03.); Thomas, Dr. J.; Varga, Dr. T.; Weller, Prof. Dr. J.; Wetzstein, Dr. M.

Guests

Gonzalez, J. (24.01.-15.02.);

PhD (D.) / Master (M.)

Arth, A. (D., Bender); Blumhof, M. (M., Bender); Clarke, J. (D., Gerhard); DeNicola, S. (D., Saglia); Fahrnschon, V. (D., Saglia); Kellermann, H. (D., Grupp); Kodric, M. (D., Bender); Krecker, K. (D., Fabricius); Lipka, M. (D., Saglia); Lippich, M. (D., Bender); Merghan, K. (D., Bender); Neu-reither B. (D., Thomas); Pulsoni, C. (D., Gerhard); Seminai-te, A. (D., Sanchez); Smolla, M. (D., Bender); Steuer, J. (D., Grupp); Wylie, S. (D., Gerhard)

Center for Astrochemical Studies

Secretary: Langer, A.

Bizzocchi, Dr. L. (until 11.12.); de Oliveira Alves, Dr. F.; Chantzoz, Dr. J. (01.04.-31.08.); Endres, Dr. Ch.; Giuliano, Dr. B.M.; Gong, Dr. M.; Hsieh, Dr. T.-H. (since 01.09.); Ivlev, Dr. A.; Jusko, Dr. P.; Küffmeier, Dr. M. (since 01.09.); Laas, Dr. J. (until 30.06.); Lattanzi, Dr. V.; Maureira Pinochet, Dr. M.J.; Müller, Dr. T., (until 29.02.); Nagy, Dr. Z. (until 29.02.); Nolan, Dr. Ch.; Pineda Fornerod, Dr. J.; Rab, Dr. Ch. (since 06.07.); Redaelli, Dr. E. (since 15.03.); Schmiedeke Dr. A.; Segura-Cox, Dr. D.; Silsbee, Dr. K.; Sipilä, Dr. O.; Spezzano, Dr. S.; Szűcs, Dr. L. (until 29.02.); Zampetaki, Dr. A.; Zhao, Dr. B. (until 18.12.)

Guests

Ali-Lagoa, Dr. V. (01.01.-21.02.); Shingledecker, Dr. Ch. (01.01.-31.08.); Kalvans, Dr. J. (13.01.-13.03.); Agurto Gangas, C. (14.03.-30.09.);

PhD (D.) / Master (M.)

Agurto Gangas, C. (until 13.03., D., Caselli); Alberton, D. (since 01.09., D., Caselli); Carl, T. (since 01.10., M., Pineda Fornerod, Schmiedeke); Chantzoz, J. (until 31.03., D., Spezzano); Choudhury, S. (D., Caselli); Ferrer Asensio, J., (since 01.09., D., Caselli); Giers, K. (since 01.10., M. Caselli); Müller, B. (D., Caselli); Prudenzano D. (until 30.04., D., Caselli); Redaelli, E. (until 14.03., D., Caselli); Winkler M., (until 31.10., D., Caselli); Valdivia Mena, M. T. (since 01.09., D., Caselli); Zamponi Fuentealba, J. (D., Caselli)

Max Planck FellowsMax Planck Fellows Group Mohr

Mohr, Prof. Dr. J.; Klein, Dr. M.; Grandis, Dr. S.; Bocquet, Dr. S.

PhD students: Paulus, M.

Working GroupsWorking Group Gerhard

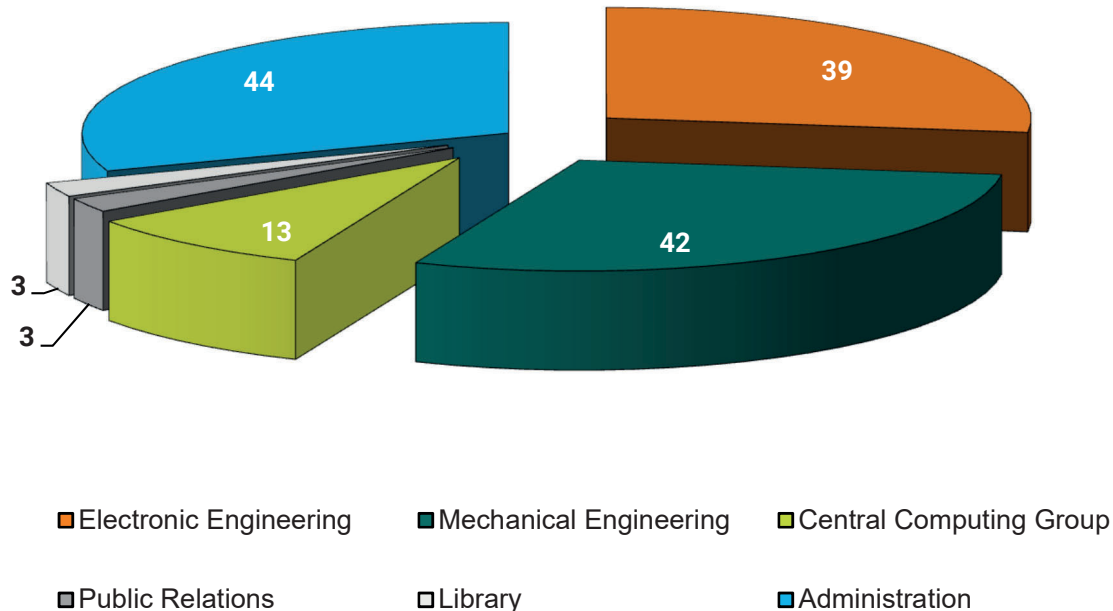
Gerhard, Dr. O.; Khoperskov, Dr. S.; Gajda, Dr. G.
PhD Students: Clarke, J.; Pulsoni, C.; Wylie, S.

Working Group van Dishoeck

van Dishoeck, Prof. Dr. E.; Cridland, Dr. A.; Hu, Dr. C.-Y.
PhD Students: Wölfer, L.

Engineering and Workshop

Engineering, Workshops and Central Services Staff



Electronical Engineering

Plattner, Dr. M. (Head of Electronics)

Albrecht, Dipl.-Ing. S.; Barl, Dipl.-Ing. (FH) L.; Bechteler, Dr. T.; Besendörfer, A.; Böhme, H.; Bornemann, Dipl.-Ing. (FH) W.; Burghardt, Dipl.-Ing. (FH) T.; Buron, M.Sc. A.; Grabichler, M.Sc. J.; Hälker, Dipl.-Ing. (FH) O.; Hans, O.; Hartmann, K.; Kink, Dipl.-Ing. (FH) W.; Köglmeier, B.; Lederhuber, M.Sc. A.; Mandla, M.Sc. C.; Müller, Dipl.-Ing. (FH) S.; Neumeier, M.Sc. L.; Ott, Dr.-Ing. S.; Penka, M.Sc. D.; Rau, M.Sc. C.; Reiffers, Dipl.-Ing. (FH) J.; Skvarc Bozic, M.Sc. G.; Schulte, Dr. W.; Yaroshenko, V.; Zanker-Smith, J.; Ziegleder, Dipl.-Ing. (FH) J.

Electronical Workshop and Utilities Management

Oberauer, F. (Head)

Bachhuber, M.; Berger A.; Cibooglu, H.; Emslander, A.; Großmann, R.; Langer, P.; Özdemir, H.; Rupprecht, T.; Schneider, M.; Schneider R.

PhD (D.) / Master (M.)

Alexander, B. (M., Plattner); Papist, H. (until 31.01., M., Tran); Neumeier, L. (M., Plattner); Annadevara, S. (M., Plattner); Uysal, S. (M., Plattner); Aracic, V. (M., Mandla); Kotre, G. G. (M., Mandla); Erhart, M. (M., Plattner)

Mechanical Engineering and Test Facilities

Schubert, Dr. J. (Head of Mechanics)

Antonelli, Dr.-Ing. V.; Bräuninger, M.Sc. K. (since 01.10.); Deysenroth, C.; Deysenroth, M.; Dittrich, Dipl.-Ing. (FH) K.; Emslander, A.; Geis, Dr. N.; Gemperlein, Dipl.-Phys. H.; Hartl, Dr. M.; Haußmann, F.; Hörmann, M.Sc. V.; Huber, Dipl.-Ing. H.; Mican, Dipl.-Ing. B.; Paßlack, Dipl.-Ing. (FH) S.; Pflüger, Dipl.-Ing. (FH) A.; Pietschner, Dipl.-Ing. (FH) D.; Rohe, C.; Strecker, R.; Frank, M.Sc. J.

Mechanical Workshop

Czempiel, S. (Head)

Bayer, R.; Brara, A.; Budau, B.; Eibl, J.; Feldmeier, P.; Furchtsam, C.; Goldbrunner, A.; Hartwig, J.; Honsberg, M.; Huber, D.; Huber, F.-X.; Kestler, H.-J.; Knapp, S.; Krautz, C.; Reinold, A.; Sandmair, R.; Schunn, W.; Schuppe, D.; Soller, F.; Waldhör, F. (since 01.02.); Zieglmeier, J. (until 31.01.)

Apprentices

Bergner, K.; Furchtsam, S.; Heckmair, S.; Lindenmüller C. (since 01.09.); Loichinger, L.; Stadler, B.; Waldhör, F. (until 31.01.)

Student Assistants and Interns

Student Assistants

Annadevara, S.; Aracic, V.; Ascanio Hecker, Y.; Beitler, C.; Bolzer, M.-L.; Clauss, M.; El Mallah, A.; Erhart, M.; Fazaa, N.; Faehling, M.; Garcia Mejia, J.; Gonzales Cabrero, J.; Haase, M.; Hameed, M.; Hannemann, L.; Hinderberger, P.; Hu, K.; Huang, Q.; Jalde, J.; Korte, G.; Kratzke, A.; Kulashekara, S.; Kurzweiler, F.; Llauze, T.; Marek, N.; Metzger, M.; Möller, J.; Papist, H.; Saam, B.; Samleben Magelund, M.; Spagnolli, M.; Starck, H.; Stelzer, T.; Uysal, S.; Vardar, A.

Work Experience (Refugees)

Abed, A.; Omar, M.K.; Safari, B.; Yusuf, M.A.

Work Experience (High School)

Bauer, S.; Bondareva, D.; Burtscher, N.; Frohwein, J.; Landry, D.; Pfefferkorn, S.; Schneider, T.; Urrich von Meyenn, F.A.

Work Experience (University)

Büttner, O.; Garcia, J.

Central Services

Computing

Central Computing Committee

Haberl, Dr. F. (Chair)

Bohnet, Dipl.-Phys. A.; Endres, Dr. C.; Fabricius, Dr. M.; von Kienlin, Dr. A.; Müller, Dipl.-Ing. (FH) S.; Ott, Dr. T.; Schubert, Dr. J.

Central IT-Group

Bohnet, Dipl. Phys. A. (Head)

Agudo Berbel, A.; Baumgartner, H.; Kleiser, A.; Klose, L.; Kollmer, C.; Oberauer, A.; Ott, Dr. T.; Paul, J.; Elsner, C.; Shigula, Dr. J.; Wieprecht, Dipl.-Ing. E.; Wiezorrek, Dipl.-Ing. (FH) E.

Public Relations

Hämmerle, Dr. H.; (Head)

Collmar, E. (until 31.10.); Niebisch, B.

Library

Bartels, C. (Head)

Blank, E., Bolicevic, M.

Administration

Wanger, H. (Head VAD)

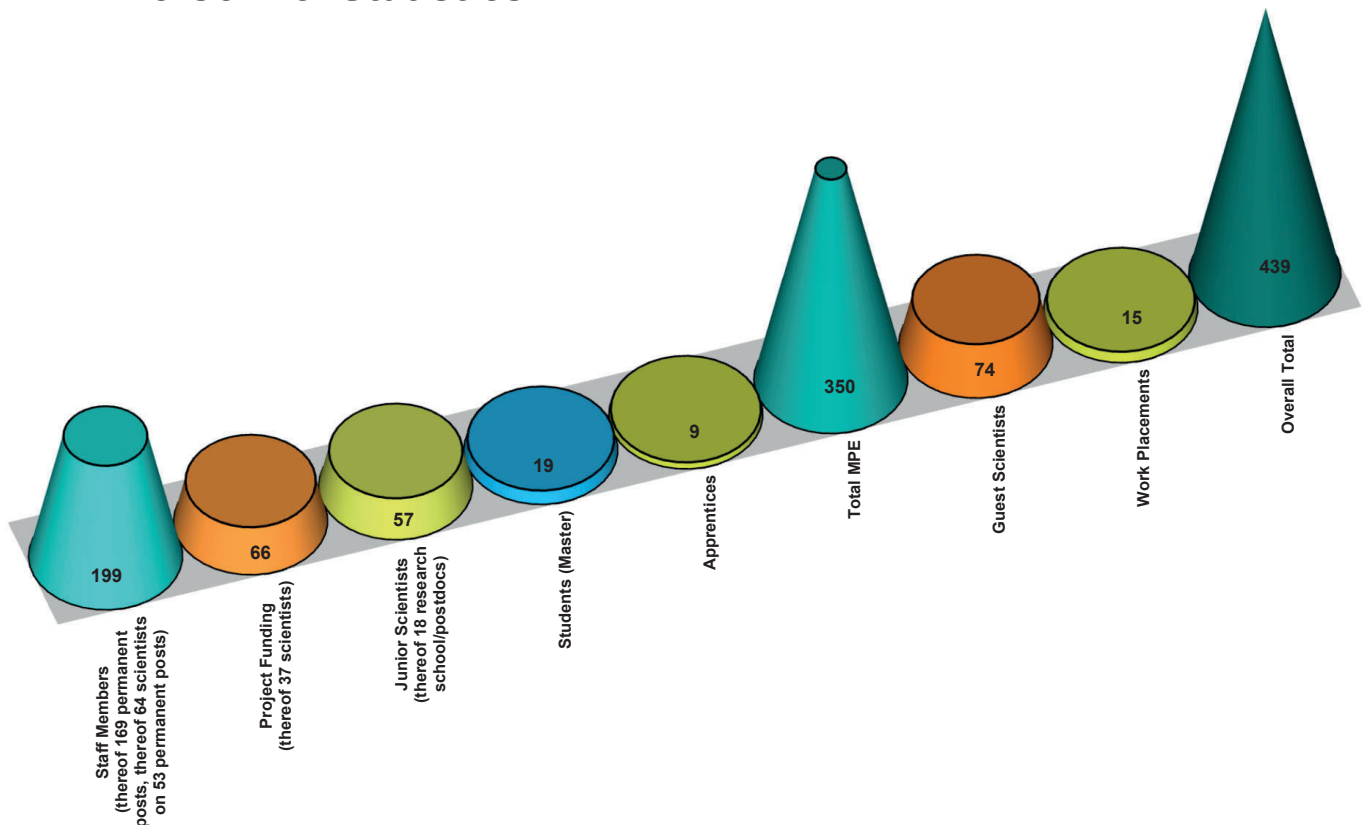
Secretary: Hesseler, G.

Apold, G.; Arturo, A.; Ayari, S.; Bauer, T.; Belscak, L.; Cziassto, U.; Eder, A.; Eicher, C.; Faust, T. (since 01.09.); Gareva, L.; Goldbrunner, S.; Grohmann, M.; Hartung, I.; Hausmann, S.; Hidasi, R.; Hofstetter, S. (until 20.07.); Jäkel, T.; Jirsch, Y.; Kaps, S.; Keil, M.; Kestler, L.; Krapivina, A.; Kuhwald, E.; Maier, E.; Nagy, A.; Neun, A. (BR); Paschou, J.; Preisler, C.; Rochner, R.; Rosenberger, S.; Sacher, A.; Schmidt, A.; Schwaiger, S.; Seyfarth, B.; Stock, C.; Stöckl, D.; Stricker, C.; Studier, S.; Thiess, F.; Thiess, L.; Üblacker, K.; Vogt, J.P.

IMPRS

Hilbert, A.

Personnel Statistics



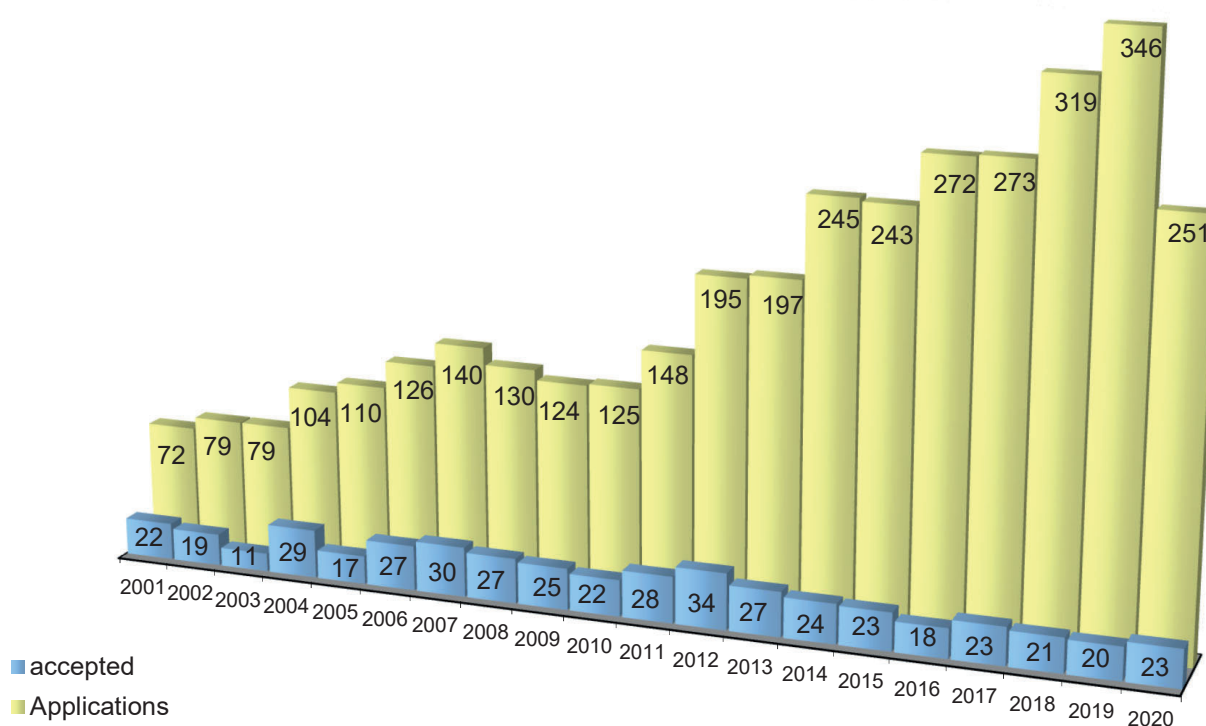
International Max Planck Research School (IMPRS) for Astrophysics

The IMPRS for Astrophysics is a graduate school at the Ludwig Maximilians University (LMU) Munich. The school is a joint project of the Max Planck Institutes MPE and MPA (Max Planck Institute for Astrophysics) as well as the Observatory of the LMU Munich and the European Southern Observatory ESO. In the academic year 2020 a total of 98 students took part in the program, thereof 47

at the MPE. 251 students from 55 countries applied for the year 2020. 23 students were accepted, thereof 8 at the MPE.

As a rule, several PhD students from local universities join the program during the year, so that on average 24 PhD students take part per year.

IMPRS Applications since 2001



Summary of annual applications for the IMPRS Program in Garching. Since its start in 2001, a total of 3578 students applied until 2020, 470 were accepted.

Public Relations Work

In 2020, the MPE engaged in the following PR activities: 29 public talks by MPE scientists, 28 press releases on scientific results and 7 general news (scientific prizes, awards). Due to the Covid-19 pandemic, activities at the institute were severely curtailed. 6 guided tours through the institute took place (mainly scientifically oriented school classes). 8 high school students (1 - 2 weeks) and 2 university students (4 - 8 weeks) were supervised during their internship at the MPE. 4 persons completed an internship for refugees (1 - 3 weeks).

The Girls' Day 2020 had to be cancelled due to the Covid-19 pandemic.

The outstanding event in 2020 was the awarding of the Nobel Prize to MPE director Reinhard Genzel on October 6. As a result, media coverage increased strongly. In the week of the announcement, Reinhard Genzel and the MPE were mentioned in 12000 media reports and about 25000 times on social media. By the end of the year, more than 100 media inquiries had been answered.

More information about the PR work at the MPE:

<http://www.mpe.mpg.de>

Project Groups

(Project Manager underlined)

Infrared and Submillimeter Astronomy

Deputy to the Director of the Group:
Lutz, Tacconi.

ERIS:
Buron, Dallilar, Ric Davies, M. Deysenroth, Eisenhauer, Feuchtgruber, Gemperlein, Hans, Hartl, H. Huber, Kleiser, Kravchenko, Mandla, Plattner, C. Rau, Schubert, Sturm, Wiezorrek.

GRAVITY, GRAVITY+:
Bauböck, Bolzer, Buron, de Zeeuw, Dengler, Drescher, Eisenhauer, Gao, Genzel, Gillessen, Jiménez Rosales, M. Haase, Hartl, Haußmann, Lutz, Mandla, More, T. Ott, C. Rau, Schubert, Shangguan, Shimizu, Stadler, Straub, Sturm, Tacconi, von Fellenberg, Widmann, Wieprecht, Wiezorrek, Yazici, Zanker-Smith.

LBT Argos:
Barl, Ric Davies, M. Deysenroth, Gemperlein, Rabien, Zanker-Smith, Ziegleder

MICADO:
Barl, Biondi, Ric Davies, Dengler, B. Eder, J. Eder, Andreas Emslander, Garrel, Geis, Gemperlein, Hartl, Haußmann, Hörmann, H. Huber, Kleiser, Kravchenko, Mandla, Neumeier, Pflüger, Plattner, Rabien, Schubert, Sturm, Ziegleder.

Galactic Center:
Bauböck, Eisenhauer, Genzel, Gillessen, Habibi, T. Ott, von Fellenberg, Jiménez Rosales, Stadler, Straub, Widmann, Young.

Galactic Nuclei:
Ric Davies, Genzel, Herrera-Camus, Kaltenbrunner, Lutz, Schrubba, Shangguan, Shimizu, Sturm, Tacconi, de Zeeuw.

Galaxies at High Redshift:
Coogan, Rebecca Davies, Förster Schreiber, Genzel, Habibi, Herrera-Camus, L. Lee, M. Lee, D. Liu, Lutz, Price, Schrubba, Sturm, Tacconi, Übler.

Star Formation:
Cridland, Hu, Schrubba, van Dishoeck, Wölfer.

High-Energy Astrophysics

ATHENA/Mirror:
Bradshaw, Budau, Burwitz, Hartner, Passlack.

ATHENA/WFI:
Albrecht, Andritschke, Antonelli, Behrens, Beitle, Bonholzer, Bornemann, Eder, Emberger, Eraerds, Frank, Freyberg, Haberl, Hälker, Hartmann, Hauser, Kink, Köglmeier, Lederhuber, Meidinger, Mican, Müller-Seidlitz, Nandra, Oser, Ott, Pietschner, Plattner, A. Rau, Reiffers, Schubert, Schweingruber, Strecker, Treberspurg, v. Kienlin.

Chandra:
Burwitz, Predehl.

Einstein Probe/Detector:
Keil, Meidinger, Nandra.

Einstein Probe/Mirror:
Burwitz, Eder, Friedrich, Gaida, Hartmann, Pfeffermann, Rohe, Schuppe, Stehlikova.

eROSITA:
Andritschke, Becker, Boller, Bornemann, Bräuninger, Brunner, Budau, Burghardt, Bulbul, Burwitz, Carpano, Coutinho, Dennerl, Dittrich, Eder, Eibl, Emberger, Eraerds, Freyberg, P. Friedrich, S. Friedrich, Gaida, Goldbrunner, Gueguen, Grossberger, Haberl, Hälker, Hartmann, Hartner, F. Huber, Kink, Maitra, Meidinger, Merloni, Mican, S. Müller, Nandra, F. Oberauer, Pfeffermann, Pietschner, Predehl, Ramos-Ceja, Rau, Reiffers, Rohé, Rupprecht, Salvato, Schrey, Schuppe, Soller, Stewart, Trümper, v. Kienlin, Yaroshenko.

ROSAT:
Boller, Freyberg, Haberl, Trümper.

Swift:
Greiner.

XMM-Newton:
Boller, Dennerl, Freyberg, Haberl, Meidinger, Trümper.

Fermi:
Collmar, Diehl, Greiner, v. Kienlin.

GROND:
A. Rau.

INTEGRAL:

Diehl, v. Kienlin, X.-L. Zhang.

MXT-SVOM:

Bradshaw, Burwitz, Meidinger, Nandra, A. Rau.

eXTP:

Bechteler, Meidinger, Nandra, Yazici.

4MOST:

Boller, Comparat, Merloni, Salvato, Thi.

Active Galaxies:

Boller, Buchner, Collmar, Comparat, Liu, Merloni, Nandra, Salvato.

Clusters of Galaxies:

Bulbul, Comparat, Gatuzz, Ghiradini, Ramos-Ceja, Sanders.

eBOSS/SPIDERS:

Comparat, Merloni, Nandra, Salvato.

Optical and Interpretative Astronomy**Large Scale Structure, eBoss, HETDEX:**

Bender, Farrow, Fabricius, Hopp, Sanchez.

EUCLID:

Bender, Escartin, Fabricius, Garcia Carpio, Gillhuber, Grupp, Guglielmo, Hartung, Penka, Raison, Saglia, Steinwagner, Wetzstein.

Galaxy Dynamics:

Bender, Dehnen, Gajda, Gerhard, Khoperskov, Parikh, Saglia, Thomas.

INODE:

Bender, Fabricius, Subramanian

KMOS:

Bender, Saglia.

MICADO:

Bender, Fabricius, Saglia, Thomas.

PanSTARRS:

Bender, Farrow, Hopp, Saglia.

Prime Focus Spectrograph:

Bender, Fabricius, Garcia Carpio, Sanchez.

Stellar Populations and Galaxy Formation:

Bender, Hopp, Parikh, Saglia.

Center for Astrochemical Studies**Observations:**

De Oliveira Alves, Maureira Pinochet, Pineda Fornerod, Redaelli, Schmiedeke, Segura-Cox.

Theory:

Gong, Ivlev, Jusko, Nolan, Rab, Shingledecker, Silsbee, Sipilä, Zhao.

Laboratory:

Bizzocchi, Endres, Giuliano, Laas, Lattanzi, Spezzano.

Teaching

Chalmers University of Technology (Göteborg, Sweden)

Caselli

Introduction to Astrochemistry (SS 20)

Dominikus-Gymnasium Karlsruhe

Straub

Wie wiegt man schwarze Löcher (WS 20/21)

Goethe-Universität Frankfurt am Main

Boller T.

AGN Physics (WS 20/21)

Dynamik des Planetensystems (SS 20)

Strahlung und Materie (SS 20)

Montan University Leoben (Austria)

Straub

Schwarze Löcher und wie man etwas wiegt, was man nicht sehen kann (WS 20/21)

Technische Universität München

Plattner

Integrated Systems for Industry and Space Applications (WS 19/20, WS 20/21)

Eisenhauer

High Angular Resolution Astronomy (SS 20)

Introduction to Astrophysics (WS 19/20)

University of Bologna (Italy)

Caselli

Star and Planet formation (WS 20)

Organisation of Scientific Seminars / Conferences

Astrochemical Frontiers - Quarantine Edition - IAU Commission H2. Virtual Conference, 15.06.-19.06., Organisation: E. Bergin (President), P. Caselli (Vice-President), J. Jorgensen (Secretary), Y. Aikawa, M. Cunningham, W. Geppert, K. Öberg, T. Millar.

IAU Symposium 359: Galaxy Evolution and Feedback across Different Environments. Bento Gonçalves, Brazil, 02.03 - 06.03, Organisation: T. Storchi-Bergmann, R. Overzier, W. Forman, F. Massaro, R. Morganti, M. Alonso, F. Combes, L. Colina, R. Davies, L. Ho, S. Komossa, P. Lira, A. Marconi, N. Nesvadba, S. Sanchez, K. Wada.

MPE-ESO-LMU Star and Planet Formation Seminar. Garching, 01.01.-31.12.2020 (twice per month), Organisation: A. Miotello, D. Segura-Cox, T. Grassi, L. Tycho-niec.

Publications

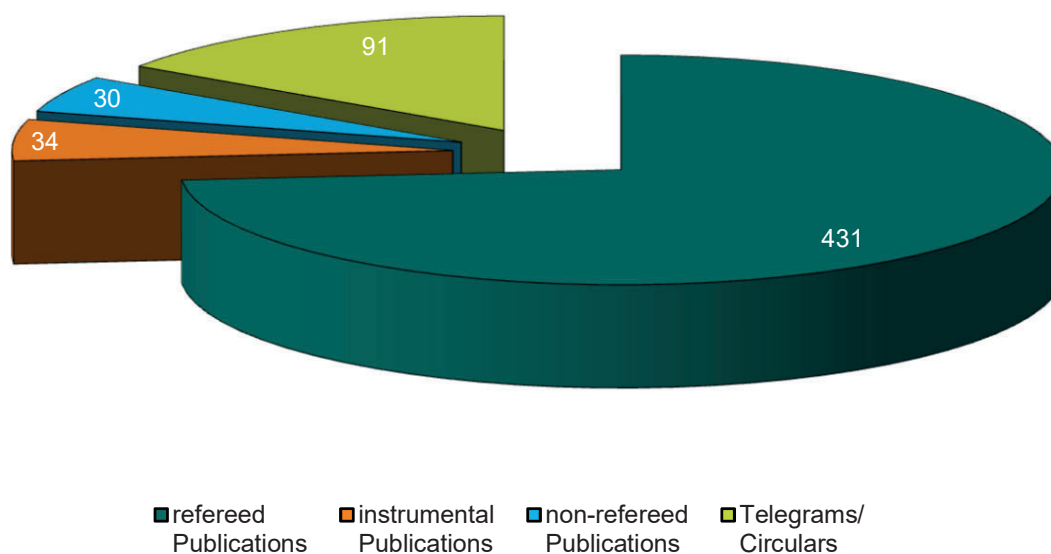
Here we present a tabular and graphical summary of our publication activities in 2020. The publications are counted by science group and publications type. The individual publications are listed consecutively.

Summary of MPE Publications in 2020

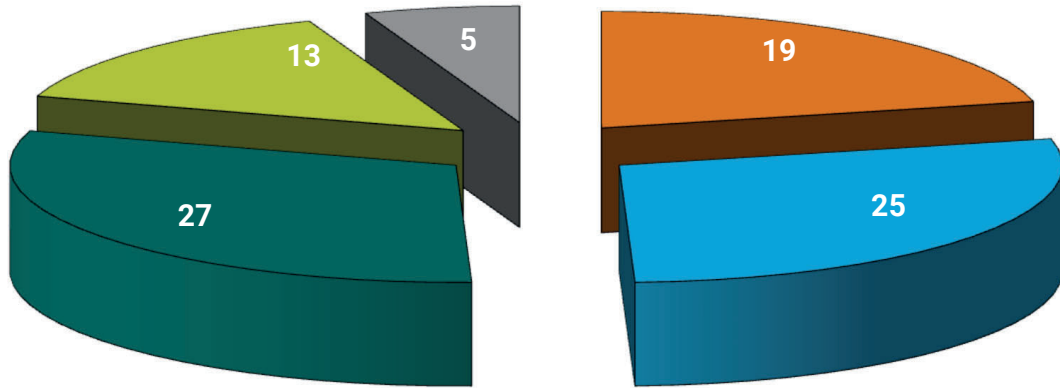
Science Groups	Refereed Publications	Instrumental Publications	Non-refereed Publications	Telegrams/Circulars	Talks	Poster
IR	19 (85)	1 (9)	0 (3)	0 (5)	34 (52)	2
HE Astrophysics	25 (126)	8 (15)	2 (5)	5 (68)	40 (58)	3
OPINAS	27 (88)	3 (7)	3 (7)	2 (4)	13 (25)	1
CAS	13 (105)	0 (2)	6 (10)	5 (10)	18 (31)	2
Research Groups	5 (27)	0 (1)	1 (5)	0 (4)	10 (17)	0
Total	89 (431)	12 (34)	12 (30)	12 (91)	115 (183)	8

The black entries give the number of publications with a first author from the MPE or invited talk, respectively. The red entries in brackets show the total number of publications with MPE contributions or talks (including the black numbers). Publications with contributions from more than one research group are counted for the group of the leading author. Posters are counted only if the first author is a MPE member.

MPE Publications 2020 (by Type)

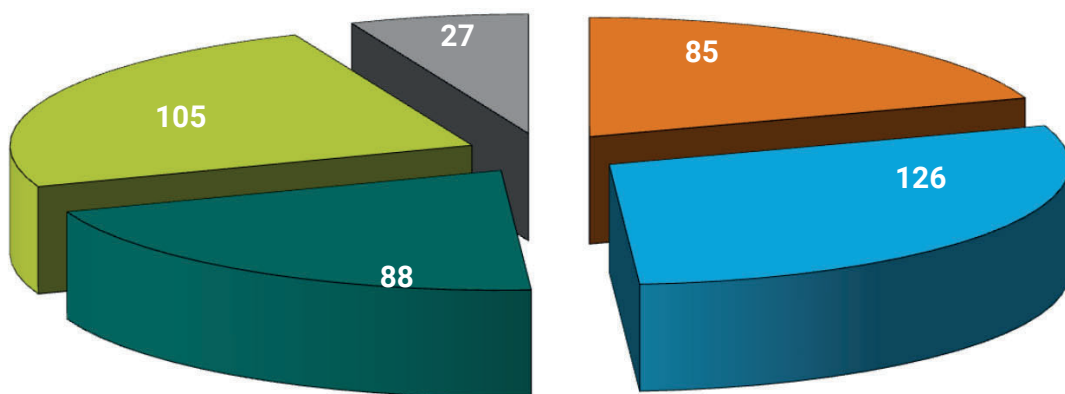


Refereed Publications with MPE first author in 2020 (by Science Group)



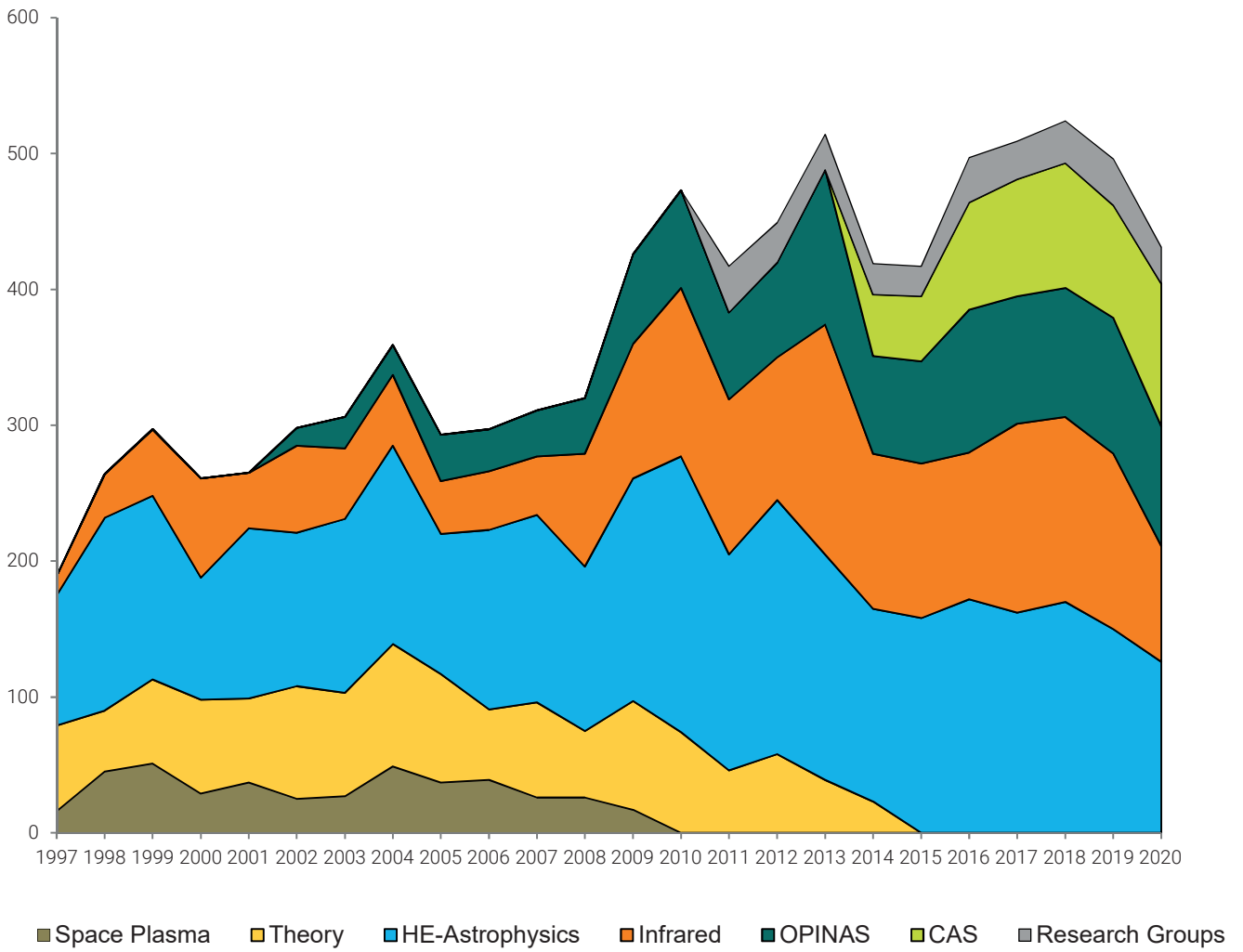
■ Infrared ■ HE-Astrophysics ■ OPINAS ■ CAS ■ Research Groups

Total refereed MPE Publications in 2020 (by Science Group)



■ Infrared ■ HE-Astrophysics ■ OPINAS ■ CAS ■ Research Groups

History of MPE Total Refereed Publications (by Science Group)



Refereed Publications

- Abbott, T.M.C., M. Aguena, A. Alarcon, S. Allam, S. Allen, J. Annis, S. Avila, D. Bacon, K. Bechtol, A. Bermeo, G.M. Bernstein, E. Bertin, S. Bhargava, S. Bocquet, D. Brooks, D. Brout, E. Buckley-Geer, D.L. Burke, A. Carnero Rosell, M. Carrasco Kind, J. Carretero, F.J. Castander, R. Cawthon, C. Chang, X. Chen, A. Choi, M. Costanzi, M. Croce, L.N. da Costa, T.M. Davis, J. de Vicente, J. de Rose, S. Desai, H.T. Diehl, J.P. Dietrich, S. Dodelson, P. Doel, A. Drlica-Wagner, K. Eckert, T.F. Eifler, J. Elvin-Poole, J. Estrada, S. Everett, A.E. Evrard, A. Farahi, I. Ferrero, B. Flaugher, P. Fosalba, J. Frieman, J. García-Bellido, M. Gatti, E. Gaztanaga, D.W. Gerdes, T. Giannantonio, P. Giles, S. Grandis, D. Gruen, R.A. Gruendl, J. Gschwend, G. Gutierrez, W.G. Hartley, S.R. Hinton, D.L. Hollowood, K. Honscheid, B. Hoyle, D. Huterer, D.J. James, M. Jarvis, T. Jeltema, M.W.G. Johnson, M.D. Johnson, S. Kent, E. Krause, R. Kron, K. Kuehn, N. Kuropatkin, O. Lahav, T.S. Li, C. Lidman, M. Lima, H. Lin, N. MacCrann, M.A.G. Maia, A. Mantz, J.L. Marshall, P. Martini, J. Mayers, P. Melchior, J. Mena-Fernández, F. Menanteau, R. Miquel, J.J. Mohr, R.C. Nichol, B. Nord, R.L.C. Ogando, A. Palmese, F. Paz-Chinchón, A.A. Plazas, J. Prat, M.M. Rau, A.K. Romer, A. Roodman, P. Rooney, E. Rozo, E.S. Rykoff, M. Sako, S. Samuroff, C. Sánchez, E. Sanchez, A. Saro, V. Scarpine, M. Schubnell, D. Scolnic, S. Serrano, I. Sevilla-Noarbe, E. Sheldon, J. Allyn. Smith, M. Smith, E. Suchyta, M.E.C. Swanson, G. Tarle, D. Thomas, C. To, M.A. Troxel, D.L. Tucker, T.N. Varga, A. von der Linden, A.R. Walker, R.H. Wechsler, J. Weller, R.D. Wilkinson, H. Wu, B. Yanny, Y. Zhang, Z. Zhang, J. Zuntz: Dark Energy Survey Year 1 Results: Cosmological constraints from cluster abundances and weak lensing. *Physical Review D* 102, 023509 (2020).
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Poster

Biondi, F.: The AIV strategy of the common path of Son Of X-Shooter. SPIE Astronomical Telescopes + Instrumentation 2020 Digital Forum, December 2020.

Dennerl, K.: The calibration of eROSITA on SRG. SPIE Astronomical Telescopes + Instrumentation, 2020, Virtual Meeting, December 2020.

Emberger, V.: Avoiding the influence of optical light and cosmic rays on X-ray measurements. SPIE Astronomical Telescopes + Instrumentation Digital Forum 2020, virtual meeting, December 2020.

Frank, J.: Structural analysis of Athena WFI Large Detector Array. Space Telescopes and Instrumentation 2018: Ultraviolet to Gamma Ray, virtual meeting, December 2020.

Maureira, M.J.: Gas and Stellar Kinematics of the Young Binary System IRAS 16293-2422 A. Threats from the surroundings 2020 Workshop, Garching, Germany, November 2020.

Müller, B.: Laboratory Investigation of Layered Ice Mixtures. EAS 2020 Virtual Meeting, Leiden, Netherlands, June/July 2020.

Niebler, F.: Fiber Fabry-Perot interferometer as calibration source for medium resolution spectrographs in the visible range. SPIE Astronomical Instrumentation 2020, Advances in Optical and Mechanical Technologies for Telescopes and Instrumentation IV, Virtual Meeting, USA, December 2020.

Wölfer, L.: A highly non-Keplerian disc - Spiral structure in the gas disc of CQ Tau. EAS 2020 Virtual Meeting, Leiden, Netherlands, June/July 2020.

Talks

- Alves, F.: A case of simultaneous star and planet formation. Contributed Talk, Five years after HL Tau: a new era in planet formation/ESO, Munich, Germany, December 2020.
- Alves, F.: Gestación Cósmica: Cómo Nacen Las Estrellas. Public Talk, 4a Jornada de la Ciencia de LABChico / LAB-Chico: Laboratorio Subterráneo de Mineral del Chico, Mineral del Chico, Mexico, December 2020.
- Boller, Th.: Beobachtungen mit dem Event Horizon Telescope. Invited Talk, Rotary Meeting des Rotary Clubs München Residenz, Bayerischer Hof, Munich, Germany (remote), March 2020.
- Boller, Th.: eROSITA CALPV Observation of the NLS1 1H 0707-495: discovery of extreme and ultra-soft X-ray variability. Invited Talk, 9th International Workshop on Astronomy and Relativistic Astrophysics, IWARA 2020, Mexico City, Mexico (remote), September 2020.
- Boller, Th.: Messungen im Galaktischen Zentrum, Gravitationswellen und Event Horizon Beobachtungen. Public Talk, Vortragsreihe der Volkssternwarte München, Volkssternwarte München in Zusammenarbeit mit der VHS München, Munich, Germany, October 2020.
- Boller, Th.: Was wissen wir wirklich über Schwarze Löcher. Public Talk, Vortragsreihe des Rotary Clubs München Bavaria, Munich, Germany (remote), December 2020.
- Boller, Th.: Was wissen wir wirklich über Schwarze Löcher. Public Talk, Montagskolloquium der Sternwarte Sonneberg, Sternwarte Sonneberg, Sonneberg, Germany, March 2020.
- Bonholzer, M.: The DEPFET detectors of Athena's WFI: Status overview. Contributed Talk, 11th WFI Consortium Meeting, remote, April 2020.
- Bulbul, E.: Astrophysics and Cosmology with eROSITA. Invited Talk, EAS 2020, Leiden, The Netherlands (remote), June 2020.
- Bulbul, E.: First Results from eROSITA Observations of Galaxy Groups and Clusters. Invited Talk, EAS 2020, Leiden, The Netherlands (remote), June 2020.
- Bulbul, E.: First Results from eROSITA Observations of Galaxy Groups and Clusters. Colloquium, Department Seminar, INAF, Milano, Italy, October 2020.
- Caselli, P.: Astrochemistry at the dawn of star and planet formation. Colloquium, Onsala Space Observatory, Onsala, Sweden, January 2020.
- Caselli, P.: From Clouds to Planets, the Astrochemical Link. Colloquium, University of Concepcion, Concepcion, Chile, July 2020.
- Caselli, P.: From Clouds to Planets, the Astrochemical Link. Invited Talk, Astrochemistry Discussions, remote, April 2020.
- Caselli, P.: Making Life from Stardust. Public Talk, Astronomy on Tap, Gothenburg, Sweden, January 2020.
- Caselli, P.: Our Astrochemical Origins. Colloquium, Kapteyn Astronomical Institute, Groningen, The Netherlands, November 2020.
- Caselli, P.: Our Astrochemical Origins. Colloquium, Munich Joint Astronomy Colloquium, Munich, Germany, May 2020.
- Caselli, P.: Our Astrochemical Origins. Colloquium, University of Georgia, Athens, USA, October 2020.
- Caselli, P.: The crucial interplay of laboratory experiments, observations and theory to unveil our astrochemical origins. Invited Talk, 236th American Astronomical Society Meeting, USA (remote), June 2020.
- Caselli, P.: The interplay of observations, experiments and theory in understanding star formation. Invited Talk, 2020 European Astronomical Society Annual Meeting – SS11 Symposium: The molecular journey from stars to disks, The Netherlands (remote), June 2020.
- Clarke, J.: The Milky Way bulge: structure and global parameters from VIRAC and Gaia. Contributed Talk, EAS, Leiden, Netherlands, July 2020.
- Comparat, J.: SPIDERS AGN. Contributed Talk, SPIDERS winter workshop, Liverpool, UK, January 2020.
- Comparat, J.: The final SDSS-IV/SPIDERS X-ray point source spectroscopic catalogue. Contributed Talk, Astronomische Gesellschaft, Germany (remote), September 2020.
- Davies, R.: Ionized outflows in local luminous AGN: what is the real density and mass outflow rate. Contributed Talk, IAU Symposium 359: Galaxy Evolution and Feedback Across Different Environments (GALFEED), Bento Gonçalves, Brazil, March 2020.
- Davies, R.: Probing AGN Feedback on Nuclear, Galactic and Circumgalactic Scales. Contributed Talk, Annual Meeting of the Deutsche Astronomische Gesellschaft, Germany (remote), September 2020.
- Davies, R.: Properties and Demographics of Ionized Gas Outflows at $z \sim 1-3$. Colloquium, Galaxies&Cosmology Seminar, Cambridge, USA, February 2020.
- de Zeeuw, T.: Lodewijk Woltjer 1930-2019. Colloquium, European Astronomical Society Annual Meeting, remote, June 2020.
- de Zeeuw, T.: Stellar Orbits in Galaxies. Colloquium, Ringberg Meeting IR Group, Ringberg, Germany, July 2020.
- de Zeeuw, T.: The Nobel Prize in Physics 2020. Public Talk, Technical University Eindhoven, Eindhoven, The Netherlands, October 2020.
- de Zeeuw, T.: The Nobel Prize in Physics 2020. Public Talk, University Twente, Enschede, The Netherlands, October 2020.
- Dennerl, K.: The thrilling PV observation of Comet C/2018 W2. Contributed Talk, Virtual German eROSITA Meeting, remote, July 2020.

- Eisenhauer, F.: A New Era of Interferometry with GRAVITY. Invited Talk, SPIE Astronomical Telescopes and Instrumentation, Los Angeles, USA, December 2020.
- Eisenhauer, F.: GRAVITY+: All-Sky, High-Contrast, Milli-Arcsecond Optical Interferometric Imaging and Spectroscopy. Colloquium, Instituto de Astrofísica de Andalucía, Granada, Spain, November 2020.
- Eisenhauer, F.: Keep the focus - The instruments revealing the Galactic Center black hole – speckle interferometry, adaptive optics, imaging spectroscopy, interferometry. Invited Talk, NYRIA Virtual Workshop, Garching, Germany, October 2020.
- Fabricius, M.: Diffuse Emission Line Regions in HETDEX. Contributed Talk, HETDEX Science Meeting, Austin, Texas, USA (remote), Jan 2020.
- Fabricius, M.: Prime Focus Spectrograph (PFS): Fiber assignment through min-cost/max-flow. Contributed Talk, SPIE Astronomical Instrumentation 2020 Observatory Operations: Strategies, Processes, and Systems VIII, USA (remote), December 2020.
- Farrow, D.: Flux limits and LAE Clustering Measurements. Contributed Talk, HETDEX 2020 Science Meeting, University of Texas, Austin, USA, January 2020.
- Förster Schreiber, N.M.: Star-forming galaxies at cosmic noon. Invited Talk, The Growth of Galaxies in the Early Universe – VI, Sesto, Italy, January 2020.
- Förster Schreiber, N.M.: Uncovering galaxy evolution with kinematics. Invited Talk, EAS2020 Symposium S6: Stellar & Gas Kinematics in Galaxies Across Cosmic Time - Connecting Observations with Theory, Leiden, The Netherlands (remote), July 2020.
- Gajda, G.: Deprojecting stellar populations in the Andromeda Galaxy. Contributed Talk, Workshop „Dynamical Reconstruction of Galaxies“, Lorentz Center, Leiden, Netherlands, February 2020.
- Gao, F.: First four telescopes large-separation off-axis fringe-tracking interferometry with GRAVITY at the VLTI. Contributed Talk, SPIE Astronomical Telescopes + Instrumentation 2020 Digital Forum, remote, December 2020.
- Genzel, R.: A 40-Year Journey. Kolloquium, Festkolloquium zum Nobelpreis für Physik 2020, Münchner Physikerkolloquium, Munich, Germany (remote), November 2020.
- Genzel, R.: Black Holes. Invited Talk, Ringberg IR-Group Meeting, Schloss Ringberg, Germany, July 2020.
- Genzel, R.: Discussion between Nobel Laureate R. Genzel and Swedish Students. Invited Talk, Goethe-Institut Stockholm, Sweden (remote), November 2020.
- Genzel, R.: Eine Reise über 40 Jahre. Invited Talk, Sitzung des Senats der Max-Planck-Gesellschaft, Berlin, Germany (remote), November 2020.
- Genzel, R.: Evidence for Cored Dark Matter Distributions from Rotation Curves of $z=0.6-2.5$ Star Forming Disks. Colloquium, UC Berkeley Astronomy Colloquium, USA, January 2020.
- Genzel, R.: Inward Bound: A 35 year Journey. Invited Talk, LISA Consortium, Leiden, The Netherlands (remote), December 2020.
- Genzel, R.: Laureate Speech at the Nobel Prize Ceremony. Invited Talk, Bayerische Staatskanzlei, Munich, Germany, December 2020.
- Genzel, R.: Our Neighborly Supermassive Black Holes. Invited Talk, APS Physics Virtual April Meeting, Washington DC, USA (remote), April 2020.
- Genzel, R.: Schwarze Löcher: Grundlagenforschung braucht Zeit. Invited Talk, Parlamentarisches Frühstück, Munich, Germany (remote), December 2020.
- Genzel, R.: State Of The Union. Invited Talk, Ringberg IR-Group Meeting, Ringberg, Germany, October 2020.
- Genzel, R.: Testing General Relativity and The Massive Black Hole Paradigm with Infrared Interferometry. Colloquium, Munich Joint Astronomy Colloquium, Munich, Germany, April 2020.
- Genzel, R.: Testing the Massive Black Hole Paradigm and GR with Infrared Interferometry. Invited Talk, Colloquium, University of Maryland, Maryland, USA, September 2020.
- Genzel, R.: Testing the Massive Black Hole Paradigm and GR with Infrared Interferometry: A 40-Year Journey. Invited Talk, Colloquium of the Department of Physics IST, University of Lisboa, Portugal (remote), December 2020.
- Genzel, R.: The formation and evolution of star forming galactic disks. Invited Talk, MPA Colloquium, Max-Planck-Institut für Astrophysik, Garching, Germany (remote), December 2020.
- Genzel, R.: Self-introductory Speech. Invited Talk, closed sessions Academicians, Pontificia Accademia delle Scienze, Vatican City (remote), Oktober 2020.
- Gerhard, O.E.: Die neue Milchstrasse. Public Talk, Astronomische Gesellschaft der Universität Zürich, Zürich, Switzerland, February 2020.
- Gerhard, O.E.: Distribution of Dark Matter and Baryons in the centre of the Milky Way. Invited Talk, ESOz-2020: The build-up of galaxies through multiple tracers and facilities, Perth, Australia, February 2020.
- Gerhard, O.E.: Dynamics of the Milky Way, a theoretical perspective. Invited Talk, Linking the Galactic and Extragalactic, Wollongong, Australia, December 2020.
- Gerhard, O.E.: Nearby Galaxies Perspective. Invited Talk, IR Ringberg Meeting, Ringberg, Germany, October 2020.
- Gerhard, O.E.: Structure and evolution of the Milky Way and nearby disk galaxies. Colloquium, LAM Colloquium, Marseille, France, November 2020.
- Gerhard, O.E.: The power of M2M. Contributed Talk, Dynamical Reconstruction of Galaxies, Lorentz Centre, Leiden, The Netherlands, February 2020.
- Gillessen, S.: Das galaktische Zentrum - Einsteins Theorie im Test. Public Talk, Anton-Bruckner-Gymnasium Straubing, Straubing, Germany, September 2020.

Gillessen, S.: Das galaktische Zentrum: Einsteins Theorie im Test. Public Talk, Faszination Astronomie Online, MPI für Astronomie, Heidelberg (remote), May 2020.

Gillessen, S.: Das Schwarze Loch im Zentrum der Milchstraße. Public Talk, Stipendiatengruppe der Hanns-Seidel-Stiftung, remote, December 2020.

Gillessen, S.: General Relativistic Effects around the Galactic Center Black Hole. Invited Talk, The Fourth Zeldovich meeting, remote, April 2020.

Gillessen, S.: General Relativistic Effects around the Galactic Center Black Hole. Colloquium, University of Surrey, UK, January 2020.

Gillessen, S.: GRAVITY+: towards faint science, all sky milli arcsecond optical interferometric imaging. Contributed Talk, SPIE / Optical and Infrared Interferometry and Imaging VII, remote, December 2020.

Gillessen, S.: Testing general relativity with the massive black hole in the Galactic Center. Invited Talk, Princeton Gravity Initiative / PCTS Workshop „Exploring Supermassive Black Holes“, remote, October 2020.

Hou, J.: Clustering measurements in the final eBOSS quasar sample and their cosmological implications. Colloquium, INPA Seminar, Berkeley, USA, January 2020.

Hou, J.: SDSS eBOSS DR16 BAO Analysis. Contributed Talk, 235th AAS meeting, Honolulu, USA, January 2020.

Ider Chitham, J.: Cosmological constraints from CODEX galaxy clusters spectroscopically confirmed by SDSS-IV/SPIDERS DR16. Contributed Talk, SDSS Gotham Collaboration Meeting, New York, USA, June 2020.

Lee, M.: Cold gas studies on a $z=2.5$ protocluster. Contributed Talk, IAU Symposium 359: Galaxy Evolution and Feedback across different Environments (GALFEED), IAU Symposium, Bento Gonçalves, Brazil, March 2020.

Lipka, M.: Robust Schwarzschild models. Colloquium, OPINAS Seminar, Garching, Germany, June 2020.

Maureira, M.J.: Gas and Stellar kinematics of the Class 0 proto-binary system IRAS 16293-2422 A. Contributed Talk, Five years after HL Tau: a new era in planet formation, Santiago de Chile, Chile (remote), December 2020.

Maureira, M.J.: Gas and Stellar Kinematics of the Class 0 proto-binary system IRAS 16293-2422 A. Colloquium, SMA Seminar, Boston, USA (remote), October 2020.

Maureira, M.J.: Orbit and mass of an embedded binary system. Colloquium, JAO Colloquium, Santiago de Chile, Chile, January 2020.

Merloni, A.: Mapping the hot Universe: the first six months of operations of eROSITA on SRG. Colloquium, Astrophysics Colloquium, University of California at Santa Cruz, USA (remote), May 2020.

Merloni, A.: New eyes on the X-ray sky: First Results from eROSITA on SRG. Colloquium, Tel Aviv University Colloquium, Tel Aviv, Israel (remote), December 2020.

Merloni, A.: New eyes on the X-ray sky: First Results from eROSITA on SRG. Colloquium, UVA/NRAO Colloqui-

um, Charlottesville, USA (remote), November 2020.

Merloni, A.: SRG/eROSITA Status update: The first all-sky survey. Invited Talk, SDSS-IV/V Collaboration Meeting, New York, USA (remote), June 2020.

Merloni, A.: eROSITA detection of large-scale X-ray bubbles in the Milky Way halo. Invited Talk, ESO Informal Discussion, Garching, Germany, December 2020.

Merloni, A.: eROSITA detection of large-scale X-ray bubbles in the Milky Way halo. Contributed Talk, Excellence Cluster Origins Science Week, Kloster Irsee, Germany (remote), November 2020.

Merloni, A.: First Results from eROSITA on SRG. Invited Talk, IKI High Energy Astrophysics Conference, Moscow, Russia, December 2020.

Merloni, A.: Mapping Large Scale Structures at High Energies: First Results from eROSITA on SRG. Invited Talk, Tenth Zeldovich Conference, Minsk, Belarus (remote), September 2020.

Merloni, A.: Mapping Large Scale Structures at High Energies: First Results from eROSITA on SRG. Invited Talk, EAS 2020, Leiden, The Netherlands (remote), June 2020.

Merloni, A.: Mapping the hot Universe: eROSITA on SRG. Colloquium, Königstuhl Colloquium (KoCo), Heidelberg, Germany, February 2020.

Merloni, A.: Mapping the hot Universe: the first eight months of operations of eROSITA on SRG. Colloquium, CEA Seminaires d'Astrophysique, Saclay, Paris, France (remote), June 2020.

Merloni, A.: Mapping the hot Universe: the first six months of operations of eROSITA on SRG. Colloquium, INAF-IAPS-Seminar, Rome, Italy (remote), May 2020.

Merloni, A.: Mapping the hot Universe: the first six months of operations of eROSITA on SRG. Colloquium, KIPAC Colloquium, University of Stanford, Stanford, USA (remote), May 2020.

Merloni, A.: Mapping the hot Universe: the first six months of operations of eROSITA on SRG. Colloquium, Join Astronomy Colloquium, Garching, Germany, April 2020.

Merloni, A.: New eyes on the X-ray sky: First Results from eROSITA on SRG. Colloquium, University of Leicester Astronomy Colloquium, Leicester, UK (remote), December 2020.

Merloni, A.: New eyes on the X-ray sky: First Results from eROSITA on SRG. Colloquium, MAGIC Colloquium, Geneva, Switzerland (remote), November 2020.

Merloni, A.: New eyes on the X-ray sky: First Results from eROSITA on SRG. Colloquium, Radboud University Colloquium, Nijmegen, The Netherlands (remote), October 2020.

Merloni, A.: New eyes on the X-ray sky: First Results from eROSITA on SRG. Colloquium, Michigan University Astronomy Colloquium, Ann Arbor, Michigan, USA (remote), October 2020.

Merloni, A.: New eyes on the X-ray sky: First Results from

- eROSITA on SRG. Colloquium, ICRAR/UWA Colloquium, Perth, Australia (remote), October 2020.
- Merloni, A.: Mapping the hot Universe: the first seven months of operations of eROSITA on SRG. Colloquium, IoA Colloquium, Cambridge, UK (remote), May 2020.
- Müller, T.: Die Hayabusa-2 Mission. Public Talk, in der Reihe "Montagsvortrag" und als Teil des "Urknall, Weltall und das Leben"-Programms, Astronomiemuseum der Sternwarte Sonneberg, Sonneberg, Germany, February 2020.
- Müller, T.: Ryugu: A strange world in the Solar System. Public Talk, Astronomy on Tap, Kooks Bar, Munich, Germany, January 2020.
- Müller, T.: Thermophysical model of the Moon from 3.7 to 15 μm . Contributed Talk, Europlanet Science Congress 2020, Granada, Spain, September 2020.
- Müller, T.: Zu Besuch bei erdnahen Asteroiden. Public Talk, Steine im Weltall, Volkssternwarte München, Munich, Germany, February 2020.
- Müller-Seidlitz, J.: Detector Development. Colloquium, 12th Athena WFI Consortium Meeting, remote, November 2020.
- Parikh, T.: Stellar population gradients in early- and late-type galaxies. Contributed Talk, SDSS-IV/V Collaboration Meeting 2020, remote, June 2020.
- Predehl, P.: eROSITA aboard SRG. Colloquium, CALTECH, Pasadena, USA, August 2020.
- Predehl, P.: eROSITA und das heiße Universum. Public Talk, Planetarium, Hamburg, Germany, October 2020.
- Predehl, P.: eROSITA und die Dunkle Energie. Public Talk, Planetarium, Hamburg, Germany, February 2020.
- Predehl, P.: eROSITA und die Dunkle Energie. Public Talk, Wilhelm-Förster-Sternwarte, Berlin, Germany, January 2020.
- Predehl, P.: eROSITA, das neue Röntgenteleskop – Auf der Jagd nach der Dunklen Energie. Public Talk, Deutsches Museum, Munich, Germany, October 2020.
- Predehl, P.: eROSITA. Colloquium, AIFA University, Bonn, Germany, May 2020.
- Predehl, P.: eROSITA. Invited Talk, Cafe&Kosmos, Munich, Germany, April 2020.
- Predehl, P.: eROSITAs steiniger Weg in den Weltraum. Public Talk, FH Rosenheim, Rosenheim, Germany, November 2020.
- Predehl, P.: The Riddle of the North Polar Spur. Invited Talk, HEA 2020, Moscow, Russia, December 2020.
- Price, S.: Resolved Views of Galaxy Evolution and Feedback at Cosmic Noon. Invited Talk, IAU Symposium 359: Galaxy Evolution and Feedback Across Different Environments (GALFEED), Bento Gonçalves, Brazil, March 2020.
- Rab, Ch.: Interpreting high spatial resolution line observations of planet-forming disks: The case of HD 163296. Contributed Talk, Five years after HL Tau: a new era in planet formation, Santiago de Chile, Chile (remote), December 2020.
- Rab, Ch.: Interpreting high spatial resolution line observations of planet-forming disks with gaps and rings - The case of HD 163296. Contributed Talk, RUTD Conference – Planet Formation Witnesses and Probes: Transition Disks, Munich, Germany (remote), October 2020.
- Ramos-Ceja, M.E.: El Universo en rayos-X: el telescopio espacial eROSITA (Spanish). Public Talk, Central American-Caribbean Bridge in Astrophysics, Central America, remote, November 2020.
- Ramos-Ceja, M.E.: Poniendo a prueba la isotropía del Universo (Spanish). Public Talk, Lecture for physics students at University of Guadalajara, Guadalajara, Mexico, April 2020.
- Ramos-Ceja, M.E.: The Universe seen through X-ray eyes: the eROSITA telescope. Public Talk, Astronomy on Tap, Gothenburg, Sweden, October 2020.
- Rau, A.: Athena WFI. Invited Talk, Athena Study training activity for new ASST member, Germany (remote), June 2020.
- Rau, A.: Athena/WFI Science. Invited Talk, Japanese Workshop for Athena, Germany (remote), December 2020.
- Rau, A.: Athena/WFI Status Update. Invited Talk, Athena/X-IFU Consortium Meeting #11, Germany (remote), April 2020.
- Rau, A.: Exploring the Hot and Energetic Universe with Athena. Public Talk, Lecture at University Bonn, Bonn, Germany (remote), May 2020.
- Rau, A.: SRG/eROSITA. Invited Talk, Enabling novel real-time multi-messenger studies – Session D: Next generation observational facilities, Germany (remote), March 2020.
- Rau, A.: Synergies of Chandra, SRG/eROSITA, and Athena in X-ray Time Domain Studies. Invited Talk, Chandra Frontiers in Time-Domain Science, Germany (remote), October 2020.
- Redaelli, E.: Deuteration of N_2H^+ and HCO^+ in the prestellar core L1544. Contributed Talk, Astrochemical Frontiers - Quarantine Edition, Munich, Germany (remote), June 2020.
- Redaelli, E.: Unveiling the magnetic properties of a protostellar core with SOFIA. Colloquium, Week's Astro UdeC Seminar, Concepcion, Chile (remote), June 2020.
- Redaelli, E.: Unveiling the Magnetic Properties of a Protostellar Core with SOFIA. Invited Talk, SOFIA Tele-Talks, Munich, Germany (remote), April 2020.
- Salvato, M.: eROSITA on SRG: a dream come true. Invited Talk, AAS 235-XRSIG session, Honolulu, Hawaii, USA, January 2020.
- Salvato, M.: eROSITA (aka: Dave, now the fun begins!). Contributed Talk, Dave Sanders's 30th Anniversary in Hawaii: Extreme Galactic Nuclear Activity – Ultraluminous

Starbursts and AGN, Honolulu, Hawaii, USA, January 2020.

Salvato, M.: eRosita: looking at the Universe with 7 open X-ray eye. Colloquium, ESA, remote, July 2020.

Salvato, M.: eROSITA: the first 365 days. Invited Talk, Probing the Extragalactic Universe with High Energy and Very High Energy Sources, remote, December 2020.

Salvato, M.: eROSITA's revolutionary view on AGN. Invited Talk, Virtual Annual Meeting of the Astronomische Gesellschaft 2020, remote, September 2020.

Salvato, M.: What will we learn from eRosita. Invited Talk, Getting ready to descend the slippery slope of multimes-sanger cosmological black holes data, Sexten, Italy, February 2020.

Sánchez, A.G.: Let us bury the prehistoric h: arguments against using Mpc/h units in cosmology. Contributed Talk, ICTP-SAIFR Latin American Workshop on Observational Cosmology, Sao Paulo, Brazil, December 2020.

Sánchez, A.G.: Let us bury the prehistoric h: arguments against using Mpc/h units in cosmology. Colloquium, COSMOSat seminar, CEA Paris-Saclay, Paris, France, August 2020.

Sánchez, A.G.: Let us bury the prehistoric h: arguments against using Mpc/h units in cosmology. Colloquium, Institute de Astrofísica de Canarias, Tenerife, Spain, July 2020.

Sánchez, A.G.: Let us bury the prehistoric h: arguments against using Mpc/h units in cosmology. Invited Talk, Cosmo@AR, Astronomic Observatory of La Plata, La Plata, Argentina, July 2020.

Sánchez, A.G.: Let us bury the prehistoric h: arguments against using Mpc/h units in cosmology. Invited Talk, Inter-institutional Laboratory for e-Astronomy, Sao Paulo, Brazil, April 2020.

Sánchez, A.G.: Let us bury the prehistoric h: arguments against using Mpc/h units in cosmology. Colloquium, MPA Cosmology Seminar, Munich, Germany, April 2020.

Sánchez, A.G.: Let us bury the prehistoric h: arguments against using Mpc/h units in cosmology. Colloquium, Joint Cambridge-Munich Journal Club, Munich, Germany, April 2020.

Sánchez, A.G.: Let us bury the prehistoric h: arguments against using Mpc/h units in cosmology. Colloquium, Astronomic Observatory of Cordoba, Cordoba, Argentina, March 2020.

Segura-Cox, D.: An Envelope Streamer Feeding a Ringed Disk in the Class I Phase. Colloquium, MPIA Disk Group (Seminar), Munich Germany, November 12, 2020.

Segura-Cox, D.: An Envelope Streamer Feeding a Ringed Disk in the Class I Phase. Colloquium, Harvard-Smithsonian Center for Astrophysics (SMA Seminar), Munich, Germany, September 2020.

Segura-Cox, D.: Observations of Class 0/I Protostars: Disk Diversity at Early Times. Invited Talk, Building Blocks

of Planets 2020, Munich, Germany, April 2020.

Segura-Cox, D.: Rings in a Young Embedded Disk: Footholds of Planet Formation at Early Times. Contributed Talk, Europlanet Science Congress 2020, Munich, Germany, September 2020.

Segura-Cox, D.: Rings in a Young Embedded Disk: Footholds of Planet Formation at Early Times. Contributed Talk, European Astronomical Society Annual Meeting 2020, Munich, Germany, July 2020.

Shangguan, J.: Resolving AGN broad line regions with the near-infrared VLTI/GRAVITY interferometer. Contributed Talk, Virtual Annual Meeting of the German Astronomical Society, Germany (remote), September 2020.

Shangguan, J.: The spatially resolved broad line region of IRAS 09149-6206. Contributed Talk, Supermassive Black Holes, Pucon, Chile, December 2020.

Shimizu, T.T.: The Molecular Gas Content of Local AGN Host Galaxies. Contributed Talk, IAUS 359: Galaxy Evolution and Feedback Across Different Environments, Bento Gonçalves, Brazil, March 2020.

Shimizu, T.T.: A complete characterisation of the sub-pc region around NGC3783 with VLTI/Gravity. Contributed Talk, Supermassive Black Holes, Chile (remote), December 2020.

Shimizu, T.T.: The resolved size and structure of hot dust around AGN with VLTI/Gravity. Contributed Talk, Annual meeting of the German Astronomical Society 2020, Germany (remote), September 2020.

Spezzano, S.: Molecules as Astrophysical tools. Colloquium, Institute Colloquium, Chalmers Universty, Sweden (remote), June 2020.

Stadler, J.: Static phase aberrations in near-IR interferometry and GRAVITY's determination of the galactic center distance. Contributed Talk, SPIE Astronomical Telescopes and Instrumentation, USA (remote), December 2020.

Straub, O.: GRAVITY Plus: Blick in den Himmel (Teil2). Invited Talk, Max Planck Foundation: Board Meeting, with prospective donors/sponsors, Munich, Germany, December 2020.

Straub, O.: GRAVITY Plus: Blick in den Himmel. Invited Talk, Max Planck Foundation, Board Meeting (Kuratorium), Munich, Germany, October 2020.

Tacconi, L.J.: Observing Molecular Gas in Star Forming Galaxies at High Redshift. Invited Talk, ngVLA Summer Talk Series, Charlottesville, USA (remote), September 2020.

Tacconi, L.J.: Observing Molecular Gas in Star Forming Galaxies at High Redshift. Invited Talk, European Astronomical Society Symposium, Linking Gas and Star Formation throughout Cosmic Time, remote, June 2020.

Tacconi, L.J.: The Evolution of the Star Forming Interstellar Medium Across Cosmic Time. Invited Talk, Origins Cluster Science Afternoons Series, Garching, Germany, December 2020.

- Tacconi, L.J.: The Evolution of the Star Forming Interstellar Medium Across Cosmic Time. Invited Talk, The Royal Swedish Academy of Sciences Astronomy and Space Science Class Meeting, Stockholm, Sweden (remote), November 2020.
- Thomas, J.: Dynamics of Elliptical Galaxies: Supermassive Black Holes, Cores and the IMF. Contributed Talk, 10th IMPRS Symposium, Garching, November 2020.
- Übler, H.: The Kinematics and Dark Matter Fractions of TNG50 Galaxies at $z=2$ from an Observational Perspective. Colloquium, Center for Computational Astrophysics, New York, USA, October 2020.
- van Dishoeck, E.: A WISH come true: Water in Star-forming regions with Herschel. Colloquium, Space Research Organization Netherlands, Utrecht, Netherlands, August 2020.
- van Dishoeck, E.: Building bridges: my career in Astrochemistry. Colloquium, Astrochemistry discussions seminar series, Boston, USA, May 2020.
- van Dishoeck, E.: Building stars, planets and the ingredients for life in space. Public Talk, Indian Academy of Sciences, New Delhi, India, October 2020.
- van Dishoeck, E.: Building stars, planets and the ingredients for life in space. Public Talk, University of Cape Town, Cape Town, South Africa, February 2020.
- van Dishoeck, E.: Chemistry of the heavens. Colloquium, Wellesley College, Cambridge, USA, April 2020.
- van Dishoeck, E.: Molecules from clouds to disks and planets. Invited Talk, University of Sao Paulo, Sao Paulo, Brazil, November 2020.
- van Dishoeck, E.: OH mid-infrared emission as a diagnostic of H₂O photodissociation. Invited Talk, Molec 2020 conference, Hamburg, Germany, August 2020.
- van Dishoeck, E.: Our origins in space. Public Talk, Carnegie Lecture, Carnegie Foundation, Washington, USA, October 2020.
- van Dishoeck, E.: Our origins in space. Public Talk, Kavli Foundation, Los Angeles, USA, June 2020.
- van Dishoeck, E.: Our origins in space. Public Talk, World Economic Forum, Davos, Switzerland, January 2020.
- van Dishoeck, E.: Probing the inner regions of disks with mid-IR spectroscopy. Invited Talk, Transitional disk meeting, Bormio, Italy, February 2020.
- van Dishoeck, E.: Zooming into planet-forming zones of disks with ALMA. Colloquium, University of Milan, Milan, Italy, December 2020.
- van Dishoeck, E.: Zooming into planet-forming zones of disks with ALMA. Colloquium, University of Athens, Athens, Greece, November 2020.
- van Dishoeck, E.: Zooming into planet-forming zones of disks with ALMA. Colloquium, Joint Astrophysics Colloquium, Munich, Germany, July 2020.
- van Dishoeck, E.: Zooming into planet-forming zones of disks with ALMA. Colloquium, UCLA, Los Angeles, USA, June 2020.
- Widmann, F.: Polarization analysis of GRAVITY and the VLTI. Contributed Talk, SPIE Astronomical Telescopes + Instrumentation, 2020, remote, December 2020.
- Widmann, F.: The supermassive blackhole in the Galactic center. Public Talk, MAGIC collaboration meeting, remote, November 2020.
- Wölfer, L: A highly non-Keplerian disc - Spiral structure in the gas disc of CQ Tau. Contributed Talk, Five Years After HL Tau, Chile (remote), December 2020.
- Wölfer, L: A highly non-Keplerian disc - Spiral structure in the gas disc of CQ Tau. Contributed Talk, RUTD-Conference (remote), Munich, Germany, October 2020.
- Wylie, S.: Abundance maps of the Milky Way's b/p bulge and long bar using the combined A2A and APOGEE surveys. Contributed Talk, MW-Gaia Workshop 2021, Heidelberg, Germany, February 2020.
- Zhao, B.: The role of microphysics and non-ideal MHD effects in the formation of protoplanetary disks. Colloquium, Astrophysics Journal Club/Seminar, McMaster University, Canada, October 2020.
- Zhao, B.: The role of microphysics and non-ideal MHD effects in the formation of protoplanetary disks. Colloquium, SMA Seminar Series, CfA at Harvard

PhD Theses

Agurto Gangas, C.: Study of grain growth in the early phases of protostars: from envelopes to disks. Ludwig-Maximilians Universität München, 2020.

Baronchelli, L.: AGN in the x-ray relativistic effects in the Fe K alpha line. Ludwig Maximilians Universität München, München, 2020.

Berlato, F.: New constraints on gamma-ray bursts. Technische Universität München, München, 2020.

Bhattacharya, S.: The survey of planetary nebulae in Andromed (M31): discrete tracers in the disc and inner halo. Ludwig Maximilians Universität München, München, 2020.

Chantzos, J.: High resolution spectroscopy of molecules of astrophysical interest and radio astronomical observations of star-forming regions. Ludwig-Maximilians Universität München, 2020.

Davies, Re.: Feedback in Galaxies During the Peak Epoch of Cosmic Star Formation Activity and Black Hole Growth. Ludwig-Maximilians-Universität München, 2020.

Jiménez-Rosales, A.: Polarization properties of GRMHD black hole accretion models. Ludwig-Maximilians-Universität München, 2020.

Käfer, F. M.: Characterization of extended emission from groups and clusters of galaxies. Ludwig Maximilians Universität München, München, 2020.

Milakovic, D.: Fundamental physics and cosmology using astronomical laser frequency combs. Ludwig-Maximilians-Universität München, 2020.

Müller-Seidlitz, J.: A megahertz active pixel sensor for X-ray astronomy: spectroscopic DEPFET arrays with integrated storage. Ludwig-Maximilians-Universität München, 2020.

Pleintinger, M. M. M.: Star groups and their nucleosynthesis. Technische Universität München, München, 2020.

Prudenzano, D.: Molecules of astrochemical interest: theoretical and experimental studies. Ludwig-Maximilians Universität München, 2020.

Redaelli, E.: Dynamical and chemical properties of magnetised star-forming regions. Ludwig-Maximilians Universität München, 2020.

Master Theses

- Beitler, C.: Thermal Design and Analysis of an X-Ray Space Instrument. Technische Universität München, 2020.
- Crosta, M.: Rest frame optical properties of Lyman-alpha emitters from the HETDEX Survey. University of Bologna, 2020.
- Erhart, M.: Implementation and optimization of non-parametric clustering algorithms on aRISC-V softcore. Technische Universität München, 2020.
- Hou, J.: Anisotropic clustering analysis of the Quasar Sample from SDSS-IV extended Baryon Oscillation Spectroscopic Survey. Ludwig-Maximilians-Universität München, 2020.
- Krecker, K.: Wendelstein First Ring: Integration and Characterisation of the Telescope Simulator and Stability of Radial Velocity Measurements. Ludwig-Maximilians-Universität München, 2020.
- Lipka, M.: Inclination recovery with Schwarzschild models. Ludwig-Maximilians-Universität München, 2020.
- Schmidt, T.: Automated Positron Beam Adjustment and New Detector Read-Out at the Coincidence Doppler Broadening Spectrometer. Technische Universität München, 2019.

Bachelor Theses

- Ahmeti, D.: Simulationen zur Entstehung und Entwicklung von Elliptischen Galaxien. Ludwig-Maximilians-Universität München, 2020.
- Azuar, S.: Zur Erforschung extrasolarer Planeten und ihrer Eigenschaften in Kepler-Multiplanetensystemen. Ludwig-Maximilians-Universität München, 2020.
- Illich, B.: Tektonik auf Exoplaneten in Zusammenhang mit der Suche nach extraterrestrischem Leben. Ludwig-Maximilians-Universität München, 2020.
- Kubanowski, E.: Das Alter einer Galaxie. Ludwig-Maximilians-Universität München, 2020.
- Matuschek, A.: Exomonde. Ludwig-Maximilians-Universität München, 2020.
- Rufer, D.: Massenbestimmung supermassereicher Schwarzer Löcher. Ludwig-Maximilians-Universität München, 2020.
- Schösser, E.: Constraining GRB Afterglow Fireballs with Late Two-Shell Collisions. Technische Universität München, 2020.
- Seidel, B.: Supermassereiche Schwarze Löcher in aktiven Galaxiekernen und die Eisen K- α Linie. Ludwig-Maximilians-Universität München, 2020.
- Thomas, L.: Die Suche nach Exoplaneten in der habitablen Zone um M-Zwerg. Ludwig-Maximilians-Universität München, 2020.
- Tschirschwitz, J.: Atmosphären und Bewohnbarkeit von erdähnlichen Exoplaneten in der habitablen Zone. Ludwig-Maximilians-Universität München, 2020.
- Tsina, I.: Die Entwicklung der Tully-Fischer Relation. Ludwig-Maximilians-Universität München, 2020.
- Waldmann, P.: Masse-Radius Beziehung bei Super-Earths und Sub-Neptunes sowie deren Verteilung. Ludwig-Maximilians-Universität, 2020.
- Yun, J.: Fragmentation of Dust Aggregates in Molecular Clouds. Ludwig-Maximilians-Universität München, 2020.

Collaborations / Transfer of Know-How

Scientific Collaborations by Country



Austria

Institut für Weltraumforschung, Graz: ATHENA WFI.
 Universität und TU Wien, Wien: MICADO; ATHENA.
 Universität Innsbruck, Innsbruck: MICADO.
 Universität Linz, Linz: MICADO.
 RICAM Linz, Linz: MICADO.

Belgium

Katholieke Universiteit Leuven, Leuven: GRAVITY+.

Canada

University of Toronto, Toronto: CAS-Theory.

Chile

ESO, Joint ALMA Observatory, Santiago de Chile: CAS-Observations; SBNAF.
 Universidad de Chile, Santiago de Chile: CAS-Observations.
 Universidad de Concepcion: Röntgen-Doppelsternsysteme; CAS-Observations; Galaxienentwicklung.
 Universidad Catolica Santiago, Santiago de Chile:

Röntgen-Doppelsternsysteme; Max-Planck-Partnergruppe Galaktisches Zentrum.

Universidad Diego Portales, Santiago de Chile: CAS-Observations.

China

Donghua University, Shanghai: CAS-Theory.

Institute for High-Energy Physics (IHEP), Peking: Gammaquellen mit COMPTEL und INTEGRAL; Einstein Probe; eXTP.

Nanjing University, Nanjing: CAS-Observations.

National Astronomical Observatories of China, Peking: PFS; CAS-Observations.

Kavli Institute for Astronomy and Astrophysics at Peking University, Peking: PFS.

Shanghai Jiao Tong University, Shanghai: PFS.

Tsinghua University, Peking: PFS.

University of Hongkong, Hongkong: Strahlungsmechanismen von Pulsaren im Röntgen- und Gammabereich.

University of Science and Technology of China, Hefei: PFS.

Xiamen University, Xiamen: PFS.

Xinjiang Astronomical Observatory, Ürümqi: CAS-Theory.

Czech Republic

Charles University, Prag: SBNAF; Hayabusa-2.

Denmark

Dänemarks Technische Universität, Lyngby: ATHENA.

Finland

University of Helsinki, Helsinki: CAS-Theory; CAS-Observations.

University of Turku - Finnish Centre for Astronomy with ESO (FINCA), Turku: MICADO.

France

Aix-Marseille University, Marseille: CAS-Theory.

CEA, Saclay: INTEGRAL-Spektrometer SPI; EUCLID; SVOM; ATHENA.

Centre d'Etude Spatiale des Rayonnements (UPS), Toulouse: INTEGRAL-Spektrometer SPI; CAS-Observations.

Centre National de la Recherche Scientifique, Paris: IN-ODE.

IAP, Paris: Nukleare Astrophysik.

IPAG, Grenoble: GRAVITY; GRAVITY+; MICADO; CAS-Observations; CAS-Theory.

IRAM, Grenoble: CAS-Observations.

IRAM, Saint-Martin-d'Hères: CAS-Observations; Galaxienentstehung.

Laboratoire d'Astrophysique de Marseille (LAM), Marseille: EUCLID; Gamma-Ray Bursts; PFS; CAS-Observations.

Laboratoire Univers et Particules de Montpellier, Montpellier: Cosmic-ray propagation in molecular clouds.

Observatoire de la Côte d'Azur Nice (OCA), Nizza: GRAVITY+.

Observatoire de Paris (GEPI), Paris: MICADO; GRAVITY.

Observatoire de Paris (LERMA), Paris: CAS-Theory.

Observatoire de Paris (LESIA), Paris: MICADO; GRAVITY.

Observatoire de Paris-Meudon, Paris: GRAVITY; GRAVITY+, Galaktisches Zentrum.

SOLEIL Synchrotron (AILES beamline), Saint-Aubin: CAS-Laboratory.

Université de Bordeaux, Bordeaux: CAS-Theory.

Université de Cergy-Pontoise, Cergy Pontoise Cedex: CAS-Observations.

Université de Lille, Lille: CAS-Laboratory.

Université de Lyon (CRAL), Lyon: GRAVITY+; CAS-Observations.

Université de Rennes, Rennes: CAS-Laboratory; CAS-Observations.

Université de Toulouse, Toulouse: CAS-Observations; CAS-Laboratory.

Universite Paris Diderot, Paris: CAS-Observations.

Université Paris-Saclay, Saclay: CAS-Laboratory; CAS-Observations.

Germany

Astrophysikalisches Institut Potsdam, Potsdam: eROSITA; XMMNewton; OPTIMA; ARGOS; HETDEX; 4MOST.

Deutsches Elektronen-Synchrotron, Hamburg: CAS-Laboratory.

European Southern Observatory (ESO), Garching: GRAVITY; GRAVITY+; Galaxienentstehung; Nukleare Astrophysik; MICADO; ERIS; Black Hole Cam; Infrared Dark Clouds; CAS-Observations; CAS-Theory.

Fraunhofer Institut für Integrierte Schaltungen, Erlangen: Mikroelektronikentwicklungen; ATHENA.

Fraunhofer Institut for Computer Graphics Research IGD, Darmstadt: IODE.

Heinrich-Heine-Universität, Düsseldorf: Soft Matter Physics.

Institut für Astronomie und Astrophysik Tübingen (IAAT), Tübingen: XMM-Newton; eROSITA; ATHENA; ESBO-DS.

Institut für Astrophysik Göttingen, Göttingen: MICADO.

Institut für Festkörperphysik und Werkstoff-Forschung, Dresden: Entwicklung weichmagnetischer Werkstoffe.

Institut für Materialphysik im Weltraum, Köln: Glasübergänge.

Landessternwarte Heidelberg-Königstuhl, Heidelberg: Galaxienentstehung; ARGOS.

Laser Zentrum Hannover, Hannover: Dichroics for ARGOS; Anti-Reflection Coating ERIS.

Ludwig-Maximilians-Universität, München: MICADO; HETDEX; eROSITA; CAS-Theory.

Max-Planck-Institut für Astronomie, Heidelberg: GRAVITY; GRAVITY+; PanSTARRS; SDSS; ARGOS; MICADO; EUCLID; CAS-Theory.

Max-Planck-Institut für Astrophysik, Garching: SDSS; OPTIMA; eROSITA; PFS.

Max-Planck-Institut für Biochemie, Martinsried: CAS-Laboratory.

Max-Planck-Institut für Gravitationsphysik, Potsdam: Black Hole Cam.

Max-Planck-Institut für Physik, Werner Heisenberg Institut, München: MPG Halbleiterlabor; Athena.

Max-Planck-Institut für Radioastronomie, Bonn: ARGOS; Black Hole Cam; CAS-Observations; CAS-Theory.

Physikalisch-Technische Bundesanstalt Berlin, Berlin: eROSITA.

Technische Universität Berlin, Berlin: Interstellares Medium.

Technische Universität Darmstadt, Darmstadt: CAST.

Technische Universität München, München: Nukleare Astrophysik; ESBO-DS.

Thüringer Landessternwarte Tautenburg, Tautenburg: GROND; Gamma-Ray Bursts.

Universität Bonn, Bonn: ATHENA; eROSITA; EUCLID; CAS-Observations.

Universität der Bundeswehr, München: SBNF.

Universität Düsseldorf, Düsseldorf: ERC Advanced Grant; CAS-Theory.

Universität Erlangen (ECAP), Erlangen: eROSITA; ATHENA.

Universität Hamburg, Hamburg: eROSITA; OPTIMA (Flarestars).

Universität Heidelberg, Heidelberg: ATHENA; XFEL; CAS-Theory.

Universität Jena, Jena: Isolierte Neutronensterne; Nukleare Astrophysik.

Universität Kassel, Kassel: CAS-Observations, CAS-Laboratory.

Universität Köln, Köln: Galaktisches Zentrum; GRAVITY; GRAVITY+; CAS-Observations; CAS-Theory; CAS-Laboratory.

Universität Mannheim, Mannheim: ATHENA; XFEL.

Universität Stuttgart, Stuttgart: ESBO-DS.

Universität Würzburg, Würzburg: AGADE.

Greece

ATHENA RC, Research and Innovation Centre in Information, Communication and Knowledge Technologies, Athen: INODE.

Infil Technologies, Athen: INODE.

University of Crete and Foundation for Research and Technology Hellas (FORTH), Heraklion: Röntgendoppeltsternsysteme; OPTIMA Photometer; Röntgen-AGN.

National Observatory of Athens, Athen: Athena; eROSITA.

Hungary

Konkoly Observatory of the Hungarian Academy of Sciences, Budapest: SBNF.

India

Tata Institute of Fundamental Research, Mumbai: CAS-Observations.

Iraq

University of AL-Muthanna, AL-Muthanna: CAS-Observations.

Ireland

National University of Ireland, Galway: High Time Resolution Astronomy; CAS-Theory.

University College Dublin, Dublin: Fermi/GBM.

Israel

School of Physics and Astronomy, Wise Observatory, Tel Aviv: Aktive Galaxien; Interstellares Medium; Galaxienentwicklung.

Italy

Free University of Bozen-Bolzano, Bozen: INODE.

IFCAI-CNR Palermo, Palermo: XMM-Newton Beobachtungen von Neutronensternen und Pulsaren.

INAF (Istituto Nazionale di Astrofisica), Rom: ATHENA, EUCLID.

INAF Arcetri, Florenz: ARGOS; LBT; ERIS; CAS-Observations; CAS-Theory.

INAF Padua, Padua: LBT; MICADO; ERIS.

INAF Roma, Rom: LBT; Nukleare Astrophysik.

INAF Teramo, Teramo: ERIS.

INAF Trieste, Triest: Gamma-Ray Bursts; Fermi/LAT.

INFN Frascati, Frascati: SIDDHARTA.

Osservatorio Astronomico di Brera, Brera: Himmelsdurchmusterung Galaxienhaufen.

Osservatorio Astrofisico di Catania, Catania: CAS-Theory; CAS-Laboratory.

Scuola Normale Superiore, Pisa: CAS-Observations.

Università Ca' Foscari Venezia, Venedig: CAS-Laboratory.

Università degli Studi di Firenze, Florenz: CAS-Observations; CAS-Theory.

Università degli Studi di Milano, Mailand: CAS-Observations.

Università degli Studi di Torino, Turin: CAS-Observations.

Università di Bologna, Bologna: EUCLID; CAS-Theory; CAS-Laboratory; CAS-Observations.

Università di Perugia, Perugia: CAS-Observations.

Japan

Academia Sinica, Nangang: PFS.

Kavli Institute for the Physics and Mathematics of the Universe, Kashiwa: PFS.

Kobe University, Kobe: CAS-Theory.

National Astronomical Observatory of Japan, Mitaka/Tokio: CAS-Theory; CAS-Observations; Galaxienentwicklung; PFS.

Institute of Physical and Chemical Research, Saitama: CAS-Observations.

Japan Aerospace Exploration Agency, Sagami-hara, Kanagawa: SBNF.

Tokio Institute of Technology (TITECH), Ookayama: ASCA/XMM-Newton Beobachtungen von AGN.

University of Osaka, Osaka: Astro-H.

University of Tokyo, Tokyo: PFS; CAS-Observations.

University of Tokyo, Institutes for Advanced Study (UTIAS), Tokyo: PFS.

Tohoku University, Sendai: Galaxienentwicklung.

Latvia

Ventspils University College, Ventspils: CAS-Theory.

Mexico

Universidad Nacional Autonoma de México, Ensenada: CAS-Observations.

Poland

Nicolaus Copernicus University, Torun: Pulsars Astronomical Centers; ATHENA.

Space Research Center (CBK), Warschau: ATHENA WFI.

Astronomical Observatory Institute, Poznań: SBNF.

University Zielona Gora, Zielona Gora: OPTIMA.

Portugal

CENTRA Lissabon und Porto, Lissabon: GRAVITY; GRAVITY+.

Observatorio Astronomico de Lisboa, Lissabon: ATHENA.

Russia

Baumann Moscow State Technical University, Moskau: Stark gekoppelte Systeme; Time-domain spectroscopy; CAS-Theory; CAS-Laboratory.

Institute of Astronomy, Moskau: CAS-Theory.

Lebedev Institute of Physics, Moskau: CAS-Theory.

Prokhorov General Physics Institute, Moskau: CAS-Laboratory.

Space Research Institute (IKI) of the Russian Academy of Science, Moskau: eROSITA/Spektrum Röntgen-Gamma.

Skobel'syn Institute of Nuclear Physics, Moskau: Nukleare Astrophysik; Gamma-Ray Bursts; AGADE.

Ural Federal University, Jekaterinburg: CAS-Theory.

Sweden

Chalmers University of Technology, Onsala Space Observatory, Onsala: CAS-Observations.

University Lund/Observatory, Lund: OPTIMA.

Switzerland

CERN, Geneva: CAST.

ETH Zürich, Zürich: ERIS.

Observatoire de Genève Sauverny, Genf: ISDC/INTEGRAL; Nukleare Astrophysik; EUCLID.

Swiss Institute of Bioinformatics, Lausanne: INODE.

Universität Basel, Basel: Nukleare Astrophysik.

University of Geneva, Genf: ATHENA.

University of Zurich, Zürich: Infrared Dark Clouds.

Zürcher Hochschule für Angewandte Wissenschaften, Zürich: INODE.

Spain

Centro de Investigaciones Energeticas, Medioambientales y Tecnologicas, Madrid: DES.

Centro de Astrobiología (CSIC/INTA), Madrid: CAS-Laboratory.

ESAC, Madrid: XMM-Newton Science Operations Center; INTEGRAL Science Operations Center; Herschel; Euclid; SBNF.

Instituto de Astrofísica de Andalucía (IAA), Granada: SBNF; ESBO-DS.

Instituto de Astrofísica de Canarias, La Laguna: SBNF.

Instituto de Ciencias del Espacio, Bellaterra: DES.

Instituto de Ciències de l'Espai, Cerdanyola del Vallès: CAS-Observations.

Institut de Física d'Altes Energies, Barcelona: DES; EUCLID.

Javalambre Physics of the Accelerating Universe Astrophysical Survey (J-PAS), Javalambre: eROSITA follow up.

SIRIS Academic SL, Barcelona: INODE.

Universitat Autònoma de Barcelona, Bellaterra: CAS-Observations.

Universidad de Valencia, Department de Astronomia, Valencia: INTEGRAL-Spektrometer SPI.

Universidad de Huelva, Huelva: CAS-Laboratory.

Universidad de Zaragoza, Zaragoza: CAST.

Observatorio Astronómico de Mallorca, Costitx: Novae; Kometen.

Observatorio Astronómico Nacional, Madrid: CAS-Observations.

South Korea

Seoul National University, Seoul: Hayabusa-2.

Taiwan

Academia Sinica Institute of Astronomy and Astrophysics (ASIAA), Taipei: CAS-Theory; CAS-Observations; PFS.
National Central University, Chungli; PanSTARRS.

The Netherlands

ESTEC, Noordwijk: XMM-Newton; INTEGRAL; EUCLID; ATHENA; eROSITA.

JIVE Dwingeloo, Dwingeloo: Black Hole Cam.

NOVA (Leiden, Groningen, ASTRON/Dwingeloo, Amsterdam): MICADO; ERIS.

Leiden University, Leiden: CAS-Observations; CAS-Theory; IR/Submm Spectroscopy.

Radboud University, Nijmegen: Black Hole Cam; CAS-Laboratory.

SRON, Utrecht: Chandra-LETG.

University of Groningen, Kapteyn Institute, Groningen: Rekonstruktion der Dichteverteilung im Universum; EUCLID; Dynamical-Chemical Models; CAS-Theory; CAS-Observations.

UK

John Moores University, Liverpool: Himmelsdurchmusterung Galaxienhaufen; Infrared Dark Clouds; CAS-Observations.

Open University, Milton Keynes: Kataklysmische Variablen; Novae; ATHENA.

Queen's University, Belfast: PanSTARRS.

Queen Mary University of London, London, UK: CAS-Observations; CAS-Theory.

Rutherford Appleton Laboratory, Council for the Central Laboratory of the Research Councils, Swindon: SIS-Junctions.

SKA Organisation, Jodrell Bank Observatory, Macclesfield: CAS-Observations.

United Kingdom Astronomy Technology Centre (UKATC), Edinburgh: EUCLID; ERIS.

University of Cambridge, Cambridge: DES.

University College London, London: High Energy Pulsars; EUCLID; DES; CAS-Observations.

University of Durham, Durham: PanSTARRS.

University of Edinburgh, Edinburgh: DES; PanSTARRS.

University of Leeds, Leeds: CAS-Theory.

University of Leicester, Leicester: XMM-Newton; ATHENA; Swift.

University of Nottingham, Nottingham: DES.

University of Portsmouth, Portsmouth: DES.

University of Sussex, Brighton: DES.

University of Southampton, Southampton: GRAVITY+; Magellanic Clouds.

USA

Argonne National Laboratory, Lemont: DES.

Brookhaven National Laboratory, Upton: strahlenharte JFETElektronik; strahlenharte Detektoren.

Benedictine College, Atchison: CAS-Theory.

California Inst. of Technology, Pasadena: X-ray Survey; PFS.

CfA, Cambridge: ATHENA/WFI; XMM-Newton/Chandra Kalibration.

Clemson University, Clemson: Gamma-Ray Bursts; Nukleare Astrophysik.

Fermilab, Batavia: DES.

Harvard University, Cambridge: PanSTARRS.

Harvard-Smithsonian Center for Astrophysics, Cambridge: CAS-Observations; CAS-Laboratory; CAS-Theory.

Institute for Astronomy, Hawaii, Honolulu: Galaxienentstehung; PanSTARRS; NIR Kamera für Wendelstein.

Johns Hopkins University, Baltimore: PanSTARRS; PFS.

Marshall Space Flight Center, Huntsville: Fermi Gamma-Ray Burst Monitor; XMM-Newton und Chandra Beobachtungen von Neutronensternen, Pulsaren und Supernova-Überresten.

MIT, Cambridge: ATHENA WFI.

NASA/Ames Research Center, Mofett Field (CA): MHD Shocks; SBNAF.

NASA/Goddard Space Flight Center, Greenbelt (MD): INTEGRAL-Spektrometer SPI; Swift.

NASA/Jet Propulsion Laboratory, Pasadena: EUCLID; PFS; CAS-Observations.

National Radio Astronomy Observatory, Charlottesville: CAS-Theory; CAS-Observations.

National Radio Astronomy Observatory, Socorro, New Mexico: CAS-Observations.

National Science Foundation, Arlington: CAS-Observations.

NOAO, Tucson: DES.

Ohio State University, Columbus: DES; LBT.

Pacific Northwest National Laboratory (PNNL), Richland: CAST.

Pennsylvania State University, State College: HETDEX; Swift; ATHENA.

Princeton University, Princeton: PFS; CAS-Theory.

Research Corporation, Tucson: LBT.

San Jose State University, San Jose: MHD shocks.

SLAC, Stanford: CAMP; DES; ATHENA.

Smithsonian Astrophysical Observatory, Cambridge: Chandra-LETGS; PanSTARRS; Röntgendoppelsterne in M31; Athena.

Space Telescope Science Institute, Baltimore: Galaxienentstehung; PanSTARRS; Turbulence; SBNAF.

Stanford University, Stanford: DES; Fermi/LAT; Fermi/GBM.

Texas A & M University, College Station: DES; SBNAF.

Texas State University, San Marcos: HETDEX.

University of Arizona, Tucson: Kosmische Strahlung; Planetenentstehung; LBT; ARGOS; CAS-Observations.

University of California, Berkeley: MPG/UCB-Kollaboration; FAST; INTEGRAL-Spektrometer SPI; Superbubbles.

University of California, Santa Cruz: DES.

University of Chicago, Chicago: CAS-Observations; DES.

University of Colorado, Boulder (Co): Superbubbles; CAS-Observations; Galaxienkerne.

University of Florida, Gainesville: Infrared Dark Clouds.

University of Hawaii, Honolulu, Hawaii: CAS-Theory.

University of Illinois, Urbana-Champaign: DES.

University of Massachusetts, Amherst: CAS-Observations.

University of Michigan, Ann Arbor: DES.

University of Nevada, Las Vegas: CAS-Observations.

University of Pennsylvania, State College: DES.

University of Pittsburgh, Pittsburgh: Galaxienentstehung.

University of Texas, Austin: Galaxienentstehung; HETDEX.

University of Texas, San Antonio: SBNAF.

University of Toledo, Toledo: Galaxienentstehung; CAS-Observations.

University of Virginia, Charlottesville: CAS-Theory; CAS-Observations.

University of Wisconsin-Madison, Madison: CAS-Theory.

Yale University, New Haven: CAS-Observations.

Multinational Collaborations - Projects

ARGOS - Laserleitstern für das LBT: Arcetri Observatory, Italy; AIP, LSW Heidelberg, MPIa, MPIfR, Germany; University of Arizona, USA.

ASPI - The International Wave Consortium: CNR-IFSI Frascati, Italy; LPCE/CNRS Orleans, France; Dept. of Automatic Control and Systems University of Sheffield, UK.

ATHENA - Advanced Telescope for High Energy Astrophysics: Dänemarks Technische Universität, Dänemark; Nikolaus Kopernikus Astronomical Center, Polen; Universität Wien, Österreich; IWF, Graz; INAF Italy, Italy; CEA Frankreich, Frankreich; University of Leicester, Open University, UK; Institut für Astronomie und Astrophysik Tübingen, Erlangen Centre for Astroparticle Physics (ECAP), Germany; ESA; NOA, Greece; Universität Geneva, Schweiz; Institute for Astrophysics, Portugal; Stanford University, USA.

BOSS - Baryon Oscillation Spectroscopic Survey: SDSSIV Collaboration.

Chandra: Marshall Space Flight Center Huntsville, Massachusetts Institute of Technology Cambridge, Smithsonian Astrophysical Observatory Cambridge, USA; Space Research Institute Utrecht, The Netherlands; Universität Hamburg, Germany.

COSMOS - Cosmological Evolution Survey: INAF-Osservatorio Astronomico di Bologna, INAF-Osservatorio Astronomico di Roma, INAF-Osservatorio Astrofisico di Arcetri, INAF/IASF-CNR, Sezione di Milano, IRA-INAf, Bologna, Dipartimento di Astronomia, Università Padova, Dipartimento di Fisica, Università degli Studi Roma Tre, Italy; Harvard-Smithsonian Centre for Astrophysics, Cambridge, Dept. of Physics, Carnegie Mellon University, Pittsburgh, Institute for Astronomy, University of Hawaii, California Institute of Technology, Pasadena, Dept. of Astronomy, Yale University, USA; INTEGRAL Science Data Centre, Versoix, Switzerland; Laboratoire d'Astrophysique de Marseille, France.

DES - Dark Energy Survey: LMU München, Excellence Cluster Universe, Germany; The Fermi National Accelerator Laboratory (Fermilab), University of Chicago, NOAO, University of Michigan, University of Pennsylvania, University of Illinois at Urbana-Champaign, Ohio State University, Texas A&M University, University of California Santa Cruz, Stanford University, SLAC National Accelerator Laboratory, The Lawrence Berkeley National Laboratory, Argonne National Laboratory, USA; University College London, University of Cambridge, University of Edinburgh, University of Portsmouth, University of Sussex, University of Nottingham, UK; Observatorio Nacional, Centro Brasileiro de Pesquisas Físicas, Universidade Federal do Rio, Brasilien; Instituto de Ciencias del Espacio, Institut de Física d'Altes Energies, Centro de Investigaciones Energéticas Medioambientales y Tecnológicas, Spain.

eBOSS - SDSS-IV Extended Baryon Oscillation Spectroscopic Survey: Carnegie Mellon University (CMU), University of Colorado Boulder, Harvard-Smithsonian Center

for Astrophysics Participation Group, Johns Hopkins University, Kavli Institute for the Physics and Mathematics of the Universe, New Mexico State University, New York University, The Ohio State University, Penn State University, University of Utah, University of Wisconsin, Yale University, USA; Max-Planck-Institut fuer Astrophysik (MPA Garching), Max-Planck-Institut für extraterrestrische Physik (MPE), Max-Planck-Institut für Astronomie (MPIA Heidelberg), Germany; National Astronomical Observatories of China, Shanghai Astronomical Observatory, China; United Kingdom Participation Group, University of Portsmouth, UK.

ERIS - Enhanced Resolution Imager and Spectrograph for the VLT: ESO, Germany; ETH Zürich, Switzerland; INAF Arcetri (with OAA, OATe and OAPd), Italy; UKATC Edinburgh, Scotland; NOVA Leiden, The Netherlands.

EinsteinProbe – Chinese Academy of Science, Institute of High Energy Physics, National Astronomical Observatories, China, ESA.

eROSITA - extended Roentgen Survey with an Imaging Telescope Array: AIP Potsdam, Universität Tübingen, Universität Bonn, Universität Erlangen, Universität Hamburg, Remis-Sternwarte Bamberg, MPA Garching, LMU (USM) München, Germany; IKI Moskau, Russia.

ESBO-DS - European Stratospheric Balloon Observatory – Design Study, EU H2020 project; University of Stuttgart, University of Tübingen, Germany; Swedish Space Corporation, Sweden; Instituto de Astrofísica de Andalucía, Spain.

EUCLID - ESA Mission to map the Dark Energy: ESA; CEA Saclay, LAM, France; University Bologna, INAF, Italy; MSSL, Durham University, UKATC UK; STScI, USA; MPIA Heidelberg, Universität Bonn, Germany.

Fermi/GBM - Fermi Gamma-Ray Burst Monitor: Marshall Space Flight Center Huntsville, University of Huntsville, USA.

Fermi/LAT - Fermi Gamma-Ray Large Area Space Telescope: Stanford University Palo Alto, Naval Research Laboratory Washington DC, Sonoma State University Rohnert Park, Lockheed Martin Corporation Palo Alto, University of California Santa Cruz, University of Chicago, University of Maryland Greenbelt, NASA Ames Research Center Moffett Field, NASA Goddard Space Flight Center for High Energy Astrophysics Greenbelt, Boston University, University of Utah Salt Lake City, University of Washington Seattle, SLAC Particle Astrophysics Group Palo Alto, USA; ICTP and INFN Trieste, Instituto Nazionale di Fisica Nucleare Trieste, Italy; University of Tokyo, Japan; CEA Saclay, France.

GRAVITY - Instrument for VLT Interferometry: MPIA Heidelberg, Universität Köln, ESO Garching, Germany; CENTRA Lisbon and Porto, Portugal; IPAG Grenoble, Observatoire de Paris / Meudon (LESIA), France.

GRAVITY+ - VLT Interferometry upgrade project: MPIA Heidelberg, Universität Köln, ESO Garching, Germany;

CENTRA Lisbon and Porto, Portugal; IPAG Grenoble, Observatoire de Paris / Meudon (LESIA), OCA Nice, CRAL Lyon, France; University of Southampton, UK; KU Leuven, Belgium.

HETDEX - Hobby-Eberly Telescope Dark Energy Experiment: University of Texas, Austin, Pennsylvania State University, Texas A&M University, USA; AIP Potsdam, LMU, USM, Germany.

INODE - Intelligent Open Data Exploration: Zürcher Hochschule für Angewandte Wissenschaften, Athena RC, Research and Innovation Center in Information, Communication and Knowledge Technologies, Fraunhofer Institute for Computer Graphics Research IGD, Infil Technologies Private Company, Center National de la Recherche Scientifique, SIRIS Academic SL, Swiss Institute of Bioinformatics, Free University of Bozen-Bolzano.

INTAS - Cooperation of Western and Eastern European Scientists: France, Germany, Norway, Russia.

ISDC - INTEGRAL Science Data Centre: Observatoire de Geneva Sauverny, Switzerland; Service d'Astrophysique Centre d'Etudes de Saclay, France; Rutherford Appleton Laboratory Oxon Dept. of Physics University Southampton, UK; Institut für Astronomie und Astrophysik Tübingen Germany; Danish Space Research Institute Lyngby, Denmark; University College Dublin, Ireland; Istituto di Fisica Milano, Istituto di Astrofisica Spaziale Frascati, Italy; N. Copernicus Astronomical Center Warsaw, Poland; Space Research Institute of the Russian Academy of Sciences Moscow, Russia; Laboratory for High Energy Astrophysics GSFC Greenbelt, USA.

INTEGRAL-Spectrometer SPI: Centre d'Etude Spatiale des Rayonnements (CESR) Toulouse, CEA Saclay Gif-sur-Yvette, France; University de Valencia Burjassot, Spain.

LBT - Large Binocular Telescope Project: MPIA Heidelberg, MPIfR Bonn, Landessternwarte Heidelberg Königstuhl, AIP, Germany; University of Arizona, Tucson, Ohio State University, Columbus, Research Corporation, USA; INAF, Italy.

MICADO - Multi-Adaptive Optics Imaging Camera for Deep Observations: ESO, LMU (USM), MPIA Heidelberg, IAG Göttingen, Germany; INAF-OAPD Padova, Italy; A* (an Austrian partnership comprising the University of Vienna, the University of Innsbruck, the University of Graz, and the University of Linz [with RICAM Linz]; specific contributions to MICADO come from Vienna/Innsbruck/Linz), Austria; NOVA (a federation several astronomical institutes; specific contributions to MICADO come from the University of Groningen, the University of Leiden, and the NOVA optical/infrared instrumentation group based at ASTRON in Dwingeloo), The Netherlands; CNRS/INSU (representing LESIA, GEPI and IPAG), Paris, France; FINCA (University of Turku) Turku, Finland.

MXT - Microchannel X-Ray Telescope for Gamma-Ray Bursts: CEA, Saclay, France; University of Leicester, UK.

OPTIMA: AIP, MPI für Astrophysik, Universität Hamburg, Germany; University of Crete, Greece; University Zielona Gora, Poland; University Lund/Observatory, Schweden.

PanSTARRS - Panoramic Survey Telescope & Rapid Response System: MPIA Heidelberg, Germany, University of Hawaii, Harvard University, Johns Hopkins Univ. Baltimore, MD, USA; Universities of Durham, Edinburgh, Belfast, UK.

PFS - The Subaru Prime Focus Spectrograph Collaboration: Kavli Institute for the Physics and Mathematics of the Universe, California Institute of Technology, NASA Jet Propulsion Laboratory, Princeton University, Johns Hopkins University, USA; The University of Tokyo Institutes for Advanced Study (UTIAS), University of Tokyo, National Astronomical Observatory of Japan, Academia Sinica, Japan; Institute of Astronomy and Astrophysics (ASIAA), Taiwan; Laboratoire d'Astrophysique de Marseille, France; Brazilian Consortium: IAG Universidad de Sao Paulo, Laboratorio Nacional de Astrofisica, Brazil; Max Planck Society, Max-Planck-Institut für Astrophysik (MPA, Garching), Max-Planck-Institut für extraterrestrische Physik (MPE), Germany; Chinese Consortium: Shanghai Jiao Tong University, National Astronomical Observatories of China, Tsinghua University, The University of Science and Technology of China, Xiamen University, Peking University, China.

SBNF - Small Bodies Near and Far, EU H2020 project; Poznań, Poland; Instituto de Astrofísica de Andalucía, Granada, Instituto de Astrofísica de Canarias (IAC), Spain; Konkoly Observatory, Budapest, Hungary; Institute of Space and Astronautical Science (ISAS, JAXA), Kanagawa, Japan.

SDSS - Sloan Digital Sky Survey: MPA Garching, MPIA Heidelberg, Germany; Univ. of Washington, Seattle, Fermi National Accelerator Laboratory, Batavia, University of Michigan, Ann Arbor, Carnegie Mellon University, Pittsburgh, Penn State University, University Park, Princeton University Observatory, Princeton, Institute of Advanced Study Princeton, Space Telescope Science Institute, Baltimore, Johns Hopkins Univ. Baltimore, USA.

Swift - Gamma-Ray Burst Mission: NASA/GSFC Greenbelt, Penn State University, USA; University of Leicester, Mullard Space Science Laboratory London, UK; Osservatorio Astronomico Brera, Italy.

XMM-Newton/SSC (Survey Science Center): AIP, Germany; SAP Saclay, CDS Strasbourg, CESR Toulouse, France; University of Leicester, Institute of Astronomy Cambridge, MSSL London, UK.

XMM-Newton/EPIC (European Photo Imaging Camera): SAP Saclay, IAS Orsay, CESR Toulouse, France; University of Leicester, University Birmingham, UK; CNR Mailand-Palermo-Bologna-Frascati, Osservatorio Astronomico Mailand, Italy; Institut für Astronomie und Astrophysik Tübingen, Germany.

Industrial Collaborations

3d shape GmbH, Erlangen: Metrology for slumped glass mirror study.

ABN GmbH, Neuried: Ongoing servicing of the MPE test facility PANTER.

AC Tech GmbH, Freiberg: ERIS Konus.

ACM GmbH, Naumburg - Acktar Ltd., Kiryat-Gat, Israel: Schwärzen für EUCLID und ERIS.

af inventions, Braunschweig: FPGA Programmierung für eROSITA.

ALPAO, Montbonnot-Saint-Martin, France: GRAVITY+ deformable mirrors.

Ariane Group GmbH, Munich: EUCLID design study, eROSITA, ATHENA, Oberflächenbeschichtung und cleanliness control EinsteinProbe.

Array Electronics, Eggingen: DAQ development OPTIMA.

Bach Research, Boulder, USA: High resolution grating for ERIS.

BASF Coatings AG, Münster: Investigations on the scattering properties of micro particles.

Bräuninger & Konstruktionen, Neuried: Construction and manufacturing of laboratory equipment.

Buchberger GmbH, Tuchenbach: Manufacturing of parts for PANTER manipulators, ERIS telescope flange.

Carl Zeiss QEC GmbH, Garching b. München, Deutschland: Messdienstleistungen, EinsteinProbe.

Christian Rehm - ISKON, Isen: Design and mechanical engineering for MICADO.

CryoVac GmbH, Troisdorf: MICADO Cryostat; ERIS SPIFFI Upgrade.

DHL Special services, Flughafen München, EinsteinProbe.

Dico-Solutions, München: eROSITA Betrieb.

DoKaSch TEMPERATURE SOLUTIONS GmbH, Kelsterbach, Deutschland: klimatisierte Frachtcontainer, EinsteinProbe.

ECM Engineered Ceramic Materials GmbH, Moosinning: Hersteller von CESIC.

EATON Powering Business Worldwide, Camarillo, CA, USA: Actuators separation-nuts for eROSITA.

ESL GmbH, Berlin: Manufacturing of circuit boards.

First Light Imaging, Meyreuil, France: GRAVITY+ wavefront sensor cameras.

Fraunhofer IOF, Jena: Mirror development for MICADO.

Freyer GmbH, Tuningen: PANTER.

GEWO Feinmechanik GmbH, Wörth/Hörlkofen: Mechanische Fertigung, ERIS.

Gräfe Spezialoptik GmbH, Camburg: Zerodur-Materialbearbeitung und -Lieferant.

Hans Englert GmbH, Berlin: Manufacturing of front panels and metering devices.

Hembach Photonik, Rednitzhembach, Optical Design, GRAVITY+.

HERMLE AG, Gosheim, Milling Machines, MPE Workshop. Hochschule München, Laserlabor, Prof. Heinz Huber, München: Materialbearbeitung mit Ultrakurzpulsar laser.

Hyprostatik, Göppingen: MICADO Hydrostatik.

Industrieanlagen – Betriebsgesellschaft mbH (IABG), Otobrunn: Testanlagen, Luftfahrtsicherheit, EinsteinProbe.

Industrieberatung Reinhard Katterloher, München: Specifications for MICADO Test Cryostat.

Ingenieurbüro Josef Eder, Hilgertshausen: System engineering for eROSITA, ATHENA, ERIS, Einstein Probe.

Ingenieurbüro Weisz, München: Design and mechanical engineering for ERIS and MICADO.

Ingenieurbüro Michael Kautz, Regensburg, Design and mechanical engineering for CAS.

IRIDIAN Spectral Technologies, Ottawa, Ontario, Canada: ERIS Filters.

Kampf Telescope Optics (KTO), München: Design & System Engineering for MICADO.

Korth Kristalle GmbH, Kiel: Lenses and windows for ERIS Spectrometer.

Kinkele GmbH & Co. KG, Ochsenfurt: ERIS Struktur.

LaserJob GmbH, Fürstfeldbruck, Deutschland: Präzisions-Laserzuschnitt und Schweißen EinsteinProbe.

LEX GmbH, Miesbach, Deutschland: Mechanische Fertigung, ATHENA, EinsteinProbe.

LT Ultra, Herdwangen-Schönach: Spiegelhersteller.

Feinmechanische Werkstätte Thomas Markl GmbH, Deisenhofen; eROSITA

Medway Optics Ltd, Rainham, Kent, UK: Optical coatings for ERIS.

M-Industrieverpackung GmbH, Sulzemoos: ERIS Transportcontainer.

OHB System AG, München: EUCLID design study.

Peter Blank GmbH, Aschaffenburg: Mechanische Fertigung MICADO

Peter Feckl Maschinenbau GmbH, Forstern: Mechanische Fertigung, ERIS, Spiegelmodule EinsteinProbe.

Plappert Industrieanlagen GmbH, Schorndorf: Design and mechanical engineering for MICADO Handling Tools.

Safran Reosc, Saint-Pierre-du-Perray, France: Mirror development MICADO.

Steinmeyer Mechatronik, Dresden: GRAVITY+ translational stages.

Tafelmaier Dünnschicht-Technik, Rosenheim: Optical Coatings, GRAVITY+.

Tyroller Hydraulic GmbH, Waidhofen: MICADO Hydrostatik.

Unholtz-Dickie Corp., Wallingford, USA: Shaker System, MPE Test Facility.

Activities in Transfer of Know-How

The high number of cooperations with industry and other research groups lead to a natural transfer of scientific and technical know-how, especially if orders are given to the industry.

By the end of 2020, the MPE held a total of 10 patents and 4 licences.