

A survey to evaluate diversity, equity and inclusion in large collaborations

J. van Scherpenberg,^{a,*} L. Heckmann,^a J. Strišković,^b A. Berti,^a D. Dorner,^c D. Elsaesser,^d J. Green,^a M. Manganaro^e and K. Satalecka^f for the MAGIC collaboration

^aMax-Planck-Institut für Physik
D-80805 München, Germany

^bJosip Juraj Strossmayer University of Osijek, Department of Physics
31000 Osijek, Croatia

^cUniversität Würzburg
D-97074 Würzburg, Germany

^dTechnische Universität Dortmund
D-44221 Dortmund, Germany

^eUniversity of Rijeka, Department of Physics
51000 Rijeka, Croatia

^fFinnish Centre for Astronomy with ESO, University of Turku
FI-20014 Turku, Finland

E-mail: jvsch@mpp.mpg.de, magic_dei@mpp.mpg.de

In 2020, the MAGIC collaboration started an initiative to improve diversity, equity and inclusion (DEI) in the collaboration. One of the major actions undertaken by this initiative was a survey which was distributed among all MAGIC members with the goal of getting a clear picture of the status quo and to identify potential problems or opportunities concerning DEI related topics. Two surveys have since been performed - one in December 2020 and one in June 2022 - covering questions related to demographics, working conditions, recognition, harassment, bullying and discrimination. In this contribution, we present the questionnaire and strategy used to run these surveys. Additionally, we describe the impact the survey had within the collaboration and which actions have been taken as a direct consequence of the survey results.

38th International Cosmic Ray Conference (ICRC2023)
26 July - 3 August, 2023
Nagoya, Japan



*Speaker

1. Introduction

In 2020 the MAGIC collaboration started a task force to be responsible for matters concerning diversity, equity and inclusion (DEI). This task force has since been engaged in raising awareness for different topics concerning DEI, has been involved at the management level of the collaboration and is undertaking efforts to evaluate the current situation, identify potential problems and find opportunities for improvements related to DEI. One major pillar of this undertaking is the plan to regularly conduct surveys in the collaboration with a frequency of ~ 2 years. Since 2020 two surveys have been performed in December 2020 and in June 2022. In the 2022 survey, 128 people participated in the survey resulting in a response rate of 43% which produced a data set well representative of the entire collaboration. We report here on the questionnaire of the second survey, which was refined according with respect to issues that were identified of special interest in the first survey. The survey focuses on five main topics: demographics, working conditions, satisfaction with MAGIC, conflicts and mental health. They are described in more detail in Section 2

Since the main purpose of the survey was to evaluate the situation in the MAGIC collaboration internally, we will not show any results here due to the data protection we promised to the participants of the survey. We only share our approach of evaluating the situation to spark similar initiatives in other collaborations.

2. Survey Questionnaire

The questionnaire used in the 2022 survey was partly published in the [MAGIC 2022 DEI questionnaire release](#)¹. Only questions concerning MAGIC internal issues have been neglected in the published version. It entails different file formats that are meant to either be easily readable or enable an easy implementation of the survey in case other collaborations want to use the same approach.

2.1 Demographics

The first section of the survey covers demographics. We asked the participants to give information among others about age, gender identity, ethnicity and length of membership in the collaboration. This data is useful to evaluate the level of diversity in various aspects, identify clear minorities and is helpful for cross-correlations with questions in the following sections.

2.2 Working Conditions

To evaluate the working conditions of collaboration members, we asked about their employment level, if it is temporary or not, if they are working in a foreign country and about language barriers. Additionally, we looked into which factors are affecting the work inside the collaboration, how satisfied people are with the collaboration and its aspects, if and why people considered quitting academia, the holiday taking behaviors and what people spend their working time on.

¹L. Heckmann, J. van Scherpenberg, J. Striskovic, A. Berti, D. Dorner, D. Elsaesser, J. Green, M. Manganaro, & K. Satalecka. (2023). [lheckmann/MAGIC_DEI_Questionnaire](#): 2022 questionnaire release (Version 2022). Zenodo. <https://doi.org/10.5281/zenodo.7906821>

2.3 Recognition of individuals within MAGIC

In addition to the satisfaction with MAGIC described above, we investigated how satisfied the participants are with the recognition inside the collaboration. This involves publication and conference rules and practises, recognition of different types of work inside MAGIC and how individual opinions are treated for different decision taken in the collaboration.

2.4 Conflicts

Considering potential conflicts arising in the collaboration, we evaluated the occurrences of sexualized harassment and bullying in the working environments of the participants taking into account the occurrences inside MAGIC, their frequency, place and relationship with the perpetrators. Additionally, we looked into discrimination, microaggressions, gender identity and what the participants know about the conflict reporting mechanisms inside the collaboration.

2.5 Mental Health

As a last part of the survey, we evaluated the mental health situation of the participants.

Depression is diagnosed based on the Patient Health Questionnaire module PHQ-8 [1], which is a common diagnostic tool for mental disorders. The PHQ-8 is the depression module measuring the presence and severity of depression symptoms by asking questions concerning emerging symptoms.

For details on the calculation see Section 3. However, as all psychological surveys and social studies are subject to many different influences and biases, which are hard to rule out completely, the mental health results should be treated as impressions of the real situation, but not used as clear facts.

3. Methods

The survey presented here was run between 08/06/2022 and 30/06/2022 using LimeSurvey², hosted by the Gesellschaft für wissenschaftliche Datenverarbeitung mbH Göttingen (GWDG)³, the computing and IT competence centre for the Max Planck Society (MPS). We neither tracked IP addresses nor did the MPS have access to any of the survey data. It was run in closed access mode with personal tokens sent to each member of the MAGIC collaboration to ensure everyone filling the survey only once.

The analysis was done using the n2survey github repository [N2 Survey Framework](#) [2], which was slightly adapted to fit this study in the branch [heckmann_tweaks_niceplots](#).

For the mental health part, the specific questions used to determine the different classifications were:

1. Little interest or pleasure in doing things
2. Feeling down, depressed or hopeless
3. Trouble falling or staying asleep, or sleeping too much

²<https://www.limesurvey.org/>

³<https://survey.academiccloud.de/>

4. Feeling tired or having little energy
5. Poor appetite or overeating
6. Feeling bad about yourself - or that you are a failure or have let yourself or your family down
7. Trouble concentrating on things, such as reading the newspaper or watching television
8. Moving or speaking so slowly that other people could have noticed? Or the opposite - being so fidgety or restless that you have been moving around a lot more than usual

For each the provided answer options were:

1. Not at all
2. Several days
3. More than half the days
4. Nearly every day
5. I don't want to answer this question

and can be converted to depression points. If not all subquestions were answered, no total score was calculated and the participant counted as "No answer."

Afterwards, the total scores can be converted to different levels of depression severeness:

- severe depression (20-24 points)
- moderately severe depression (15-19 points)
- moderate depression (10-14 points)
- mild depression (5-9 points)
- no to minimal depression (0-4 points)

4. Impact

After designing the surveys and distributing them across the entire collaboration we reported on the results in collaboration meetings and for the 2022 results produced an internal report summarizing all results in an anonymized way. All of this resulted in an overall increased awareness on DEI topics. The transparency of structures inside the collaboration and how decisions that affect the collaboration are taken and communicated has improved owing to the presented results. Efforts were undertaken to improve the recognition of individual contributions of corresponding authors in collaboration papers. Early career and DEI representatives now contribute to discussions at management level of the collaboration. Collaboration members are now more aware of potential sexual harassment and bullying or mobbing, which is a known issue in academia in general. After the first survey in 2020 a reporting mechanism was introduced by appointing an Ombudsperson and

creating an anonymous form to report and resolve conflicts. Additionally a code of conduct was written and distributed in the collaboration.

In general, the results of the surveys sparked many ideas and proposals for further improvements of the working environment in the collaboration and workshops to be organized for the collaboration members.

5. Conclusion

The DEI surveys have been perceived well by the collaboration members and are strongly supported by the management of the collaboration since they have provided beneficial information and raised awareness. They sparked valuable discussions, motivated changes for improving the situation and inspired ideas for more actions to be taken by the management and the DEI task force. Further improvements will be monitored in the coming years with repetitions of the DEI survey, which by now is designed in a convenient way to be easily implemented, adjusted and analyzed.

References

- [1] Kroenke, K., Spitzer, R. L., Williams, J. B., Löwe, B. 2010, General hospital psychiatry, 32 (4), pp. 345-359. <https://doi.org/10.1016/j.genhosppsych.2010.03.006>
- [2] Guliev, R.R., Fu, D., Schindler, F., Lee, C.Y., Pietsch J., Knüpfer, L., Ruffini, N., Beck, T., Becker, A., Neumann O., Löffler, K., Heckmann, L. (2022). Zenodo. <https://doi.org/10.5281/zenodo.6891900>

Full Authors List: MAGIC Collaboration

H. Abe¹, S. Abe¹, J. Abhir², V. A. Acciari³, I. Agudo⁴, T. Aniello⁵, S. Ansoldi^{6,46}, L. A. Antonelli⁵, A. Arbet Engels⁷, C. Arcaro⁸, M. Artero⁹, K. Asano¹, D. Baack¹⁰, A. Babic¹¹, A. Baquero¹², U. Barres de Almeida¹³, J. A. Barrio¹², I. Batkovic⁸, J. Baxter¹, J. Becerra González³, W. Bednarek¹⁴, E. Bernardini⁸, M. Bernardos⁴, J. Bernete¹⁵, A. Berti⁷, J. Besenrieder⁷, C. Bigongiari⁵, A. Biland², O. Blanch⁹, G. Bonnoli⁵, Ž. Bošnjak¹¹, I. Burelli⁶, G. Busetto⁸, A. Campoy-Ordaz¹⁶, A. Carosi⁵, R. Carosi¹⁷, M. Carretero-Castrillo¹⁸, A. J. Castro-Tirado⁴, G. Ceribella⁷, Y. Chai⁷, A. Chilingarian¹⁹, A. Cifuentes¹⁵, S. Cikota¹¹, E. Colombo³, J. L. Contreras¹², J. Cortina¹⁵, S. Covino⁵, G. D'Amico²⁰, V. D'Elia⁵, P. Da Vela^{17,47}, F. Dazzi⁵, A. De Angelis⁸, B. De Lotto⁶, A. Del Popolo²¹, M. Delfino^{9,48}, J. Delgado^{9,48}, C. Delgado Mendez¹⁵, D. Depaoli²², F. Di Pierro²², L. Di Venere²³, D. Dominis Prester²⁴, A. Donini⁵, D. Dorner²⁵, M. Doro⁸, D. Elsaesser¹⁰, G. Emery²⁶, J. Escudero⁴, L. Fariña⁹, A. Fattorini¹⁰, L. Foffano⁵, L. Font¹⁶, S. Fröse¹⁰, S. Fukami², Y. Fukazawa²⁷, R. J. García López³, M. Garczarczyk²⁸, S. Gasparyan²⁹, M. Gaug¹⁶, J. G. Giesbrecht Paiva¹³, N. Giglietto²³, F. Giordano²³, P. Gliwny¹⁴, N. Godinovic³⁰, R. Grau⁹, D. Green⁷, J. G. Green⁷, D. Hadasch¹, A. Hahn⁷, T. Hassan¹⁵, L. Heckmann^{7,49}, J. Herrera³, D. Hrupec³¹, M. Hütten¹, R. Imazawa²⁷, T. Inada¹, R. Iotov²⁵, K. Ishio¹⁴, I. Jiménez Martínez¹⁵, J. Jormanainen³², D. Kerszberg⁹, G. W. Kluge^{20,50}, Y. Kobayashi¹, P. M. Kouch³², H. Kubo¹, J. Kushida³³, M. Láinez Lezáun¹², A. Lamastra⁵, D. Lelas³⁰, F. Leone⁵, E. Lindfors³², L. Linhof¹⁰, S. Lombardi⁵, F. Longo^{6,51}, R. López-Coto⁴, M. López-Moya¹², A. López-Oramas³, S. Loporchio²³, A. Lorini³⁴, E. Lyard²⁶, B. Machado de Oliveira Fraga¹³, P. Majumdar³⁵, M. Makariev³⁶, G. Maneva³⁶, N. Mang¹⁰, M. Manganaro²⁴, S. Mangano¹⁵, K. Mannheim²⁵, M. Mariotti⁸, M. Martínez⁹, M. Martínez-Chicharro¹⁵, A. Mas-Aguilar¹², D. Mazin^{1,52}, S. Menchiari³⁴, S. Mender¹⁰, S. Mićanović²⁴, D. Miceli⁸, T. Miener¹², J. M. Miranda³⁴, R. Mirzoyan⁷, M. Molero González³, E. Molina³, H. A. Mondal³⁵, A. Moralejo⁹, D. Morcuende¹², T. Nakamori³⁷, C. Nanci⁵, L. Nava⁵, V. Neustroev³⁸, L. Nickel¹⁰, M. Nieves Rosillo³, C. Nigro⁹, L. Nikolic³⁴, K. Nilsson³², K. Nishijima³³, T. Njoh Ekoume³, K. Noda³⁹, S. Nozaki⁷, Y. Ohtani¹, T. Oka⁴⁰, A. Okumura⁴¹, J. Otero-Santos³, S. Paiano⁵, M. Palatiello⁶, D. Paneque⁷, R. Paoletti³⁴, J. M. Paredes¹⁸, L. Pavletic²⁴, D. Pavlovic²⁴, M. Persic^{6,53}, M. Pihet⁸, G. Pirola⁷, F. Podobnik³⁴, P. G. Prada Moroni¹⁷, E. Prandini⁸, G. Principe⁶, C. Priyadarshi⁹, W. Rhode¹⁰, M. Ribó¹⁸, J. Rico⁹, C. Righi⁵, N. Sahakyan²⁹, T. Saito¹, S. Sakurai¹, K. Satalecka³², F. G. Saturni⁵, B. Schleicher²⁵, K. Schmidt¹⁰, F. Schmuckermaier⁷, J. L. Schubert¹⁰, T. Schweizer⁷, A. Sciacaluga⁵, J. Sitarek¹⁴, V. Sliusar²⁶, D. Sobczynska¹⁴, A. Spolon⁸, A. Stamerra³, J. Strišković³¹, D. Strom⁷, M. Strzys¹, Y. Suda²⁷, T. Suric⁴², S. Suutarinen³², H. Tajima⁴¹, M. Takahashi⁴¹, R. Takeishi¹, F. Tavecchio⁵, P. Temnikov³⁶, K. Terauchi⁴⁰, T. Terzić²⁴, M. Teshima^{7,54}, L. Tosti⁴³, S. Truzzi³⁴, A. Tutone⁵, S. Ubach¹⁶, J. van Scherpenberg⁷, M. Vazquez Acosta³, S. Ventura³⁴, V. Verguillov³⁶, I. Viale⁸, C. F. Vigorito²², V. Vitale⁴⁴, I. Vovk¹, R. Walter²⁶, M. Will⁷, C. Wunderlich³⁴, T. Yamamoto⁴⁵,

¹ Japanese MAGIC Group: Institute for Cosmic Ray Research (ICRR), The University of Tokyo, Kashiwa, 277-8582 Chiba, Japan

² ETH Zürich, CH-8093 Zürich, Switzerland

³ Instituto de Astrofísica de Canarias and Dpto. de Astrofísica, Universidad de La Laguna, E-38200, La Laguna, Tenerife, Spain

⁴ Instituto de Astrofísica de Andalucía-CSIC, Glorieta de la Astronomía s/n, 18008, Granada, Spain

⁵ National Institute for Astrophysics (INAF), I-00136 Rome, Italy

⁶ Università di Udine and INFN Trieste, I-33100 Udine, Italy

⁷ Max-Planck-Institut für Physik, D-80805 München, Germany

⁸ Università di Padova and INFN, I-35131 Padova, Italy

⁹ Institut de Física d'Altes Energies (IFAE), The Barcelona Institute of Science and Technology (BIST), E-08193 Bellaterra (Barcelona), Spain

¹⁰ Technische Universität Dortmund, D-44221 Dortmund, Germany

¹¹ Croatian MAGIC Group: University of Zagreb, Faculty of Electrical Engineering and Computing (FER), 10000 Zagreb, Croatia

¹² IPARCOS Institute and EMFTEL Department, Universidad Complutense de Madrid, E-28040 Madrid, Spain

¹³ Centro Brasileiro de Pesquisas Físicas (CBPF), 22290-180 URCA, Rio de Janeiro (RJ), Brazil

¹⁴ University of Lodz, Faculty of Physics and Applied Informatics, Department of Astrophysics, 90-236 Lodz, Poland

¹⁵ Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas, E-28040 Madrid, Spain

¹⁶ Departament de Física, and CERES-IEEC, Universitat Autònoma de Barcelona, E-08193 Bellaterra, Spain

¹⁷ Università di Pisa and INFN Pisa, I-56126 Pisa, Italy

¹⁸ Universitat de Barcelona, ICCUB, IEEC-UB, E-08028 Barcelona, Spain

¹⁹ Armenian MAGIC Group: A. Alikhanyan National Science Laboratory, 0036 Yerevan, Armenia

²⁰ Department for Physics and Technology, University of Bergen, Norway

²¹ INFN MAGIC Group: INFN Sezione di Catania and Dipartimento di Fisica e Astronomia, University of Catania, I-95123 Catania, Italy

²² INFN MAGIC Group: INFN Sezione di Torino and Università degli Studi di Torino, I-10125 Torino, Italy

²³ INFN MAGIC Group: INFN Sezione di Bari and Dipartimento Interateneo di Fisica dell'Università e del Politecnico di Bari, I-70125 Bari, Italy

²⁴ Croatian MAGIC Group: University of Rijeka, Faculty of Physics, 51000 Rijeka, Croatia

²⁵ Universität Würzburg, D-97074 Würzburg, Germany

²⁶ University of Geneva, Chemin d'Ecogia 16, CH-1290 Versoix, Switzerland

²⁷ Japanese MAGIC Group: Physics Program, Graduate School of Advanced Science and Engineering, Hiroshima University, 739-8526 Hiroshima, Japan

²⁸ Deutsches Elektronen-Synchrotron (DESY), D-15738 Zeuthen, Germany

²⁹ Armenian MAGIC Group: ICRANet-Armenia, 0019 Yerevan, Armenia

- ³⁰ Croatian MAGIC Group: University of Split, Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture (FESB), 21000 Split, Croatia
- ³¹ Croatian MAGIC Group: Josip Juraj Strossmayer University of Osijek, Department of Physics, 31000 Osijek, Croatia
- ³² Finnish MAGIC Group: Finnish Centre for Astronomy with ESO, University of Turku, FI-20014 Turku, Finland
- ³³ Japanese MAGIC Group: Department of Physics, Tokai University, Hiratsuka, 259-1292 Kanagawa, Japan
- ³⁴ Università di Siena and INFN Pisa, I-53100 Siena, Italy
- ³⁵ Saha Institute of Nuclear Physics, A CI of Homi Bhabha National Institute, Kolkata 700064, West Bengal, India
- ³⁶ Inst. for Nucl. Research and Nucl. Energy, Bulgarian Academy of Sciences, BG-1784 Sofia, Bulgaria
- ³⁷ Japanese MAGIC Group: Department of Physics, Yamagata University, Yamagata 990-8560, Japan
- ³⁸ Finnish MAGIC Group: Space Physics and Astronomy Research Unit, University of Oulu, FI-90014 Oulu, Finland
- ³⁹ Japanese MAGIC Group: Chiba University, ICEHAP, 263-8522 Chiba, Japan
- ⁴⁰ Japanese MAGIC Group: Department of Physics, Kyoto University, 606-8502 Kyoto, Japan
- ⁴¹ Japanese MAGIC Group: Institute for Space-Earth Environmental Research and Kobayashi-Maskawa Institute for the Origin of Particles and the Universe, Nagoya University, 464-6801 Nagoya, Japan
- ⁴² Croatian MAGIC Group: Ruđer Bošković Institute, 10000 Zagreb, Croatia
- ⁴³ INFN MAGIC Group: INFN Sezione di Perugia, I-06123 Perugia, Italy
- ⁴⁴ INFN MAGIC Group: INFN Roma Tor Vergata, I-00133 Roma, Italy
- ⁴⁵ Japanese MAGIC Group: Department of Physics, Konan University, Kobe, Hyogo 658-8501, Japan
- ⁴⁶ also at International Center for Relativistic Astrophysics (ICRA), Rome, Italy
- ⁴⁷ now at Institute for Astro- and Particle Physics, University of Innsbruck, A-6020 Innsbruck, Austria
- ⁴⁸ also at Port d'Informació Científica (PIC), E-08193 Bellaterra (Barcelona), Spain
- ⁴⁹ also at Institute for Astro- and Particle Physics, University of Innsbruck, A-6020 Innsbruck, Austria
- ⁵⁰ also at Department of Physics, University of Oslo, Norway
- ⁵¹ also at Dipartimento di Fisica, Università di Trieste, I-34127 Trieste, Italy
- ⁵² Max-Planck-Institut für Physik, D-80805 München, Germany
- ⁵³ also at INAF Padova
- ⁵⁴ Japanese MAGIC Group: Institute for Cosmic Ray Research (ICRR), The University of Tokyo, Kashiwa, 277-8582 Chiba, Japan