Crisis overcome

The labour market for physicists

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The labour market for physicists is in better shape this year than it has been f o r years. Despite a minimal increase of two per cent, the number of unemployed is significantly below the level before the coronavirus crisis. In comparison with the overall labour market The labour market for physicists has recovered better from the coronavirus crisis, with the number of job vacancies increasing significantly by 35% for the second year in a row, which is higher than ever before.

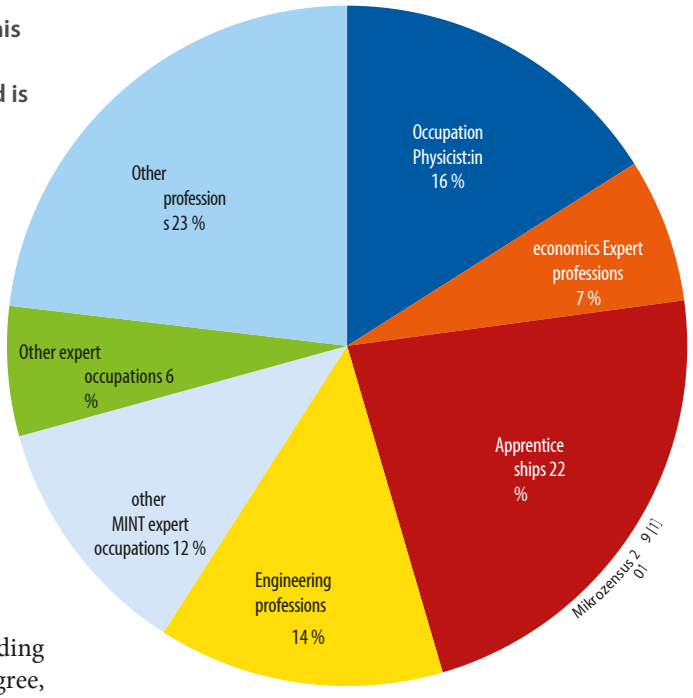

Fig. 1 Among the diverse occupational fields for physicists, the "gainful occupation of physicist" only accounts for just under one sixth.

F here are two data sources for the labour market of physicists - the figures from the microcensus and those from the Federal Employment Agency.
work. The former are based on an extensive survey and modelling. As a result, they shed light on a situation that dates back three to four years of the labour market - currently the year 2019.
census considers all employed physicists who, according to self-reporting, have an academic physics degree, totalling 116,800 people [1]. They work in many professions (**Fig. 1**). The microcensus puts the proportion working in traditional physics professions, i.e. the "gainful occupation of physicist", at 16 per cent [2]. The data from the Federal Agency is published monthly or annually and only refers to the group "Gainful employment as a physicist" from the microcensus. The DPG receives data on unemployment and vacancies for "physicists" annually as part of a special evaluation based on the September figures of the respective year.

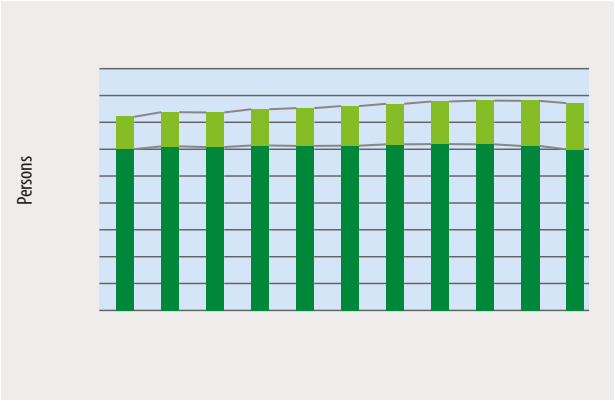

Fig. 2 The Federal Employment Agency has been recording the number of employees subject to social insurance contributions in the "gainful occupation of physicist" for women (light green) and men (dark green) since 2012. Since then, it has remained virtually constant for men, while the i n c r e a s e is mainly due to women.

year under review. The figures on employees subject to social insurance contributions provided by the Federal Agency below always refer to the end of the calendar year [3].

Employees

The number of physicists employed and subject to social insurance contributions fell slightly to 15,445 in 2022. (-1.0 %; reporting date: 31 December 2022). An increase among women (3.1 %) compensates for the decrease among men (-2.1 %) (**Fig. 2**). Employers report this data to the Federal Employment Agency so that it is based on the definition used in the respective company.
"Physicist" and the total is somewhat lower than in the microcensus.

While the proportion of women among employees subject to social insurance contributions has risen from 17 to 22 per cent since 2012, the number of men has remained almost constant. The reasons for this development and how it should be analysed require more in-depth investigation than is possible within the scope of this report.

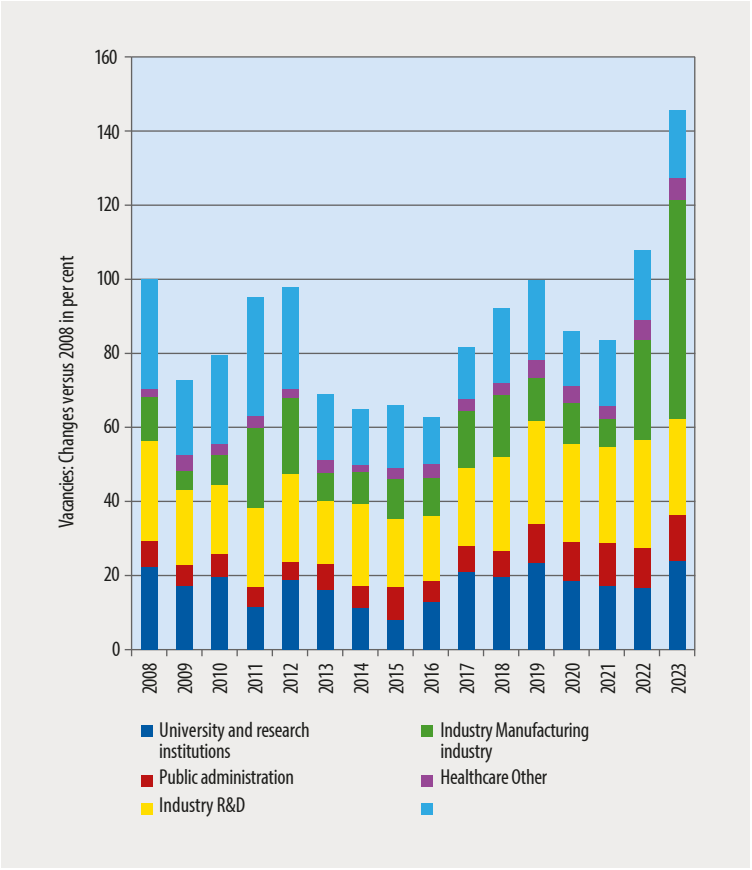

Fig. 3 The vacancies for physicists available to the Federal Employment Agency can be broken d o w n by sector and plotted relative to the total number in 2008.

Vacancies

The Federal Agency only records vacancies that employers report for the "gainful occupation of physicist". Accordingly, the job market is significantly larger, as physicists work in many more professions. Companies in the field of physics also fill less than ten per cent of their vacancies with the participation of the Federal Employment Agency [4]. Nevertheless, the vacancies registered there point to trends. Compared to 2022, the number of vacancies has increased by around 35 per cent this year.

increased (**Fig. 3**). We see this second major increase in a row as a trend reversal after the coronavirus pandemic in 2020 and 2021: there are the most vacancies in the "Physicist" occupation since the DPG began collecting this figure. We interpret this as an indication of the increasing shortage of skilled labour, as demand in the "industry and manufacturing" sector in particular has doubled.

Unemployed

The Federal Agency has published a subject-specific unemployment rate of 2.3 per cent for the subject group "Maths, Statistics, Physics" for 2022 [5], which remains unchanged from the previous year [6]. Compared to the survey in the corona year 2020 (2.7 %) [7], even below the 2018 level (2.4 %) [8]. This low rate corresponds to quasi "full employment".

The Federal Agency calculates absolute unemployment figures for the "gainful occupation of physicist" on a monthly basis. Compared to the previous year (reporting period October to September), the overall figure has risen slightly by around 2 per cent (**Fig. 4**), with women (7 %) significantly more than men (0.3 %). The proportion of women among the unemployed in 2023 is 22 per cent. The published figures are based on people who are unemployed according to the Federal Agency's definition and who state in their registration that they are looking for a job in the "gainful occupation of physicist" [9].

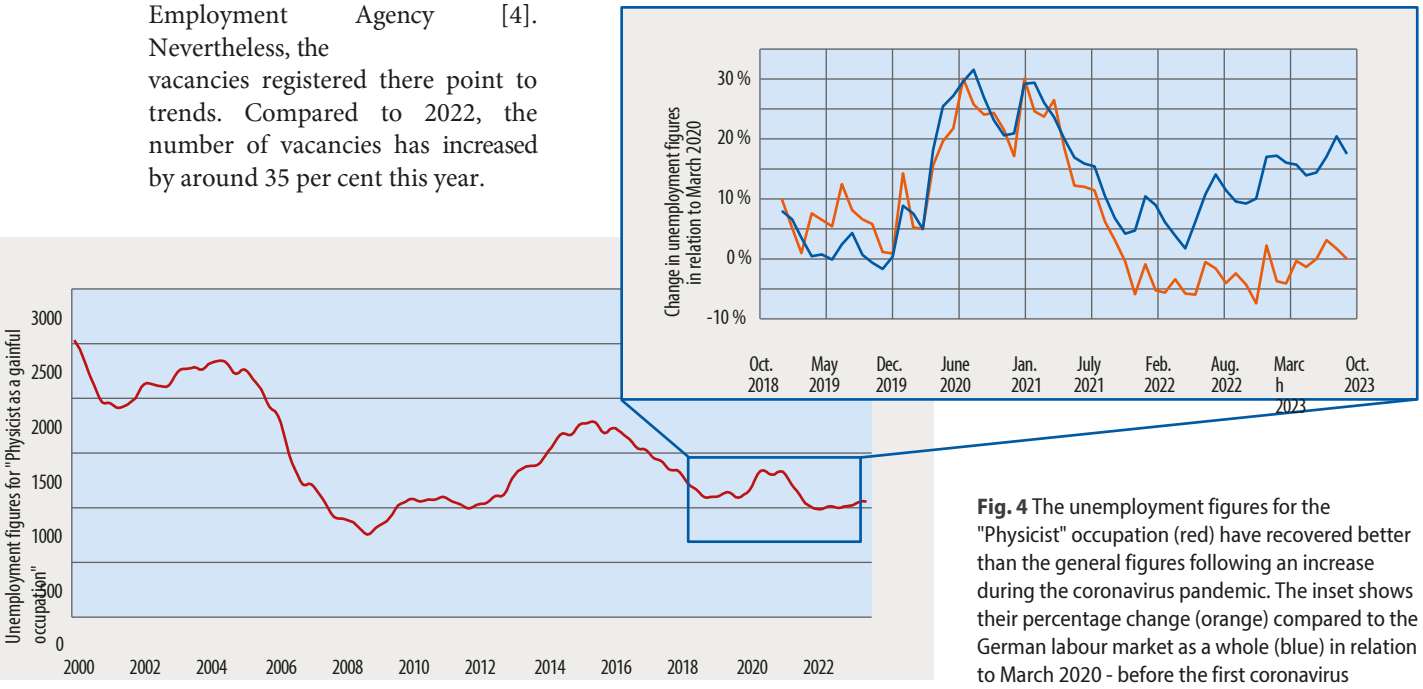

Fig. 4 The unemployment figures for the "Physicist" occupation (red) have recovered better than the general figures following an increase during the coronavirus pandemic. The inset shows their percentage change (orange) compared to the German labour market as a whole (blue) in relation to March 2020 - before the first coronavirus lockdown.

Unemployment figures in the "physicist" occupation behaved similarly to the overall unemployment figures during the crisis. After peaking during the waves of the coronavirus pandemic, they have since fallen again; since mid-2021, unemployment figures in the "physicist occupation" have even outperformed the labour market as a whole (**Fig. 4**, inset). Even at the height of the crisis, the number of unemployed physicists remained very robust and was far from the highs of 2015 or even 2004.

Duration of unemployment

The average duration of unemployment in 2023 across all age groups is 180 days. Almost half (46%) of unemployed physicists are in the cohort of 25 to 34-year-olds: they are unemployed for an average of 147 days - a lower figure than in the two previous years (2022: 158 days; 2021: 174 days) and back at pre-crisis levels. It stands to reason that it was more difficult to enter the labour market during the pandemic. Even though the high-tech sector was and is less affected economically by the pandemic, the hiring of new employees was postponed by several months in some cases. The proportion of 35- to 44-year-olds (27%) and 45- to 54-year-olds (12%) among unemployed physicists is similarly low as in previous years: Physicists who have found their way into the profession rarely become unemployed.

Summary

The labour market for physicists has recovered significantly after the coronavirus pandemic. The pandemic-related increase in the number of unemployed people from March 2020 to March 2021 has been overcome: The figure has even been below the pre-crisis level for two years. Another sign of the current excellent labour market for physicists is the significant increase in vacancies.

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We would like to thank the Federal Employment Agency for the
the statistical data.

Literature and further information

[1] Own calculations based on the 2019 microcensus
[2] The microcensus is a statistical survey in which certain households participate according to random criteria. It is based on self-reporting by the participants. More details on the definition of the "Physicists in the labour market" see *O. Koppel*, Physikerinnen und Physiker im Beruf - Anschlussstudie für die Jahre 2005 bis 2013 - Eine Studie im Auftrag der DPG, Bad Honnef (2016); *www.dpg- physik.de/veroeffentlichungen/publikationen/studien-der-dpg/pix- studien/arbeitsmarktstudie_2016.pdf*
[3] In this evaluation (as in previous years), the following occupational codes belong to the "gainful occupation of physicist": 41404, 41484, 41494, 41414 and 41403. This is a subgroup of the group "414 - physicist", which is often generally analysed in the publications of the Federal Employment Agency.
[4] *O. Koppel*, Physikerinnen und Physiker im Beruf - Arbeitsmarkt-entwicklung, Einsatzmöglichkeiten und Demographie - Eine Studie im Auftrag der DPG, Bad Honnef (2010); *www.dpg-physik.de/vero-publications/studies-of-the-dpg/pix-studies/studies/labour-market_2010.pdf*
[5] Federal Employment Agency statistics; reports: Focus on the labour market (online report) - academics, July/August 2023
[6] Statistics of the Federal Employment Agency; Reports: Focus on the labour market: Academics 2022; *statistik.arbeitsagentur.de/DE/Na- vigation/Statistiken/Themen-im-Fokus/Berufe/Akademikerinnen/Akademiker/All- gemeiner-Teil-Nav.html* (accessed on 14 October 2022)
[7] Statistics of the Federal Employment Agency; Reports: Focus on the labour market: Academics 2021
[8] Statistics from the Federal Employment Agency; Reports: Focus on the labour market - academics, April 2019
[9] Unemployed persons are jobseekers who are temporarily not in employment, are seeking employment subject to social insurance contributions for at least 15 hours a week, are available to the placement efforts of the employment agency or job centre and have registered as unemployed with an employment agency or job centre.

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