

# QuSpin Balance Project | 2021-2022

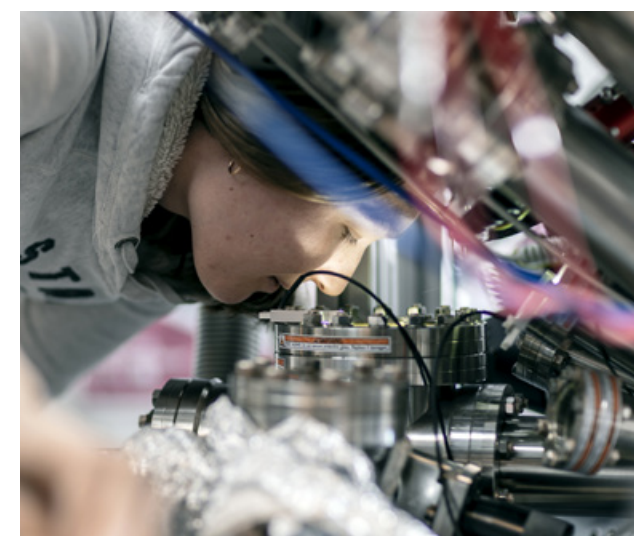
How to get more Female Physicists into Top Positions in Academia  
- About Gender Balance and Diversity





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## Our Vision

is to see more female researchers within the fields of theoretical and experimental physics in top positions in Academia, at NTNU and elsewhere.

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*The balance project strengthens our important effort towards an improved gender balance.*  
- Professor Arne Brataas

*By becoming aware of and thereafter confronting our own attitude toward minority groups, we take a first decisive step closer to a more diverse academic environment.*  
- Professor Jacob Linder

*The project created arenas for focused, collective reflection informed by personal experiences – an important foundation for building an open environment and making considerate change.*  
- Senior researcher Sol H. Jacobsen

*The project has led to important learning and reflections, and increased motivation to improve diversity and gender balance in the Center.*  
- Professor Vivian Anette Lagesen

*The balance project significantly strengthens QuSpin's expressed work toward an improved gender balance in research within natural sciences.*  
- Professor Asle Sudbø

## PROJECT MANAGER KAREN-ELISABETH SØDAHL

# Foreword



Our most significant impact on the future is through the personnel we train, and QuSpin has been fortunate in attracting the best talents.

We have fulfilled our goal that minimum 1/3 of new hirings with QuSpin funding should be female researchers.

Gladly, we have also achieved another remarkable aim in our field: 50 % of our master's students in 2022-2023 were female. We are grateful to the RCN Balance Project for supporting improvements in the gender balance at QuSpin.

There are too few female researchers in top positions within Academia in general, and QuSpin is no exception. The main goal of the RCN Balance Program is to help more women to top positions within Academia. Increased diversity and gender balance amongst the researchers, also within quantum physics, both in the theoretical and experimental fields, will reflect society in science. This was our main motivation for applying for this RCN project.

Our Balance Project was action-based, not research-based. However, the experiences and learning points from our project could fit very well into a scientific context of theoretical references and models. This will have to be looked into later, in case NTNU and the Department of Physics would want to invest time and resources into a new project.

The main learning point from this project is that working on change requires a clear goal, diligence and continuous awareness and effort. This project has hopefully resulted

in increased awareness of diversity and gender balance and the importance of nurturing a safe and open culture where everyone feels welcome and comfortable. As the leader group of QuSpin, we don't control all factors for supporting career development for everybody at our Center, but we do have the power over our own values, attitude, and priorities. We would like to thank everyone involved in this project: the leader group, the project group, members of our advisory board, mentors, mentees, supporters outside QuSpin and everyone at our Center for their willingness to participate, contribute with and share their experience, competence, reflections and ideas into this project, and for lending us their ears.

We will continue to build a research environment where we can support everybody's personal and career development on individual and center level. But if we want to make a real change for the future, we need some of these activities to become formalized at the structural and systemic level. On short term there are three things we would like to see: mentoring as a standard activity accompanied by a budget; mandatory gender-balanced recruitment committees; and diversity competence training of leaders, supervisors and members of recruitment committees.

Today, mentoring program is offered for female associate professors only, but we believe it would be of great value if this could start at earlier career stages, following the example of the University of Hamburg and their "dynaMENT" mentoring program designed for temporary staff. We also recommend including mentors from outside one's own department or institution for freer communication.

# Our Motivation

QuSpin is an international Research Center of Excellence at NTNU within theoretical and experimental quantum physics and nano technology. We are in the forefront of research, competence, and publications. We have a diversity of permanent and temporary researchers from twelve countries.

The Center is strongly male-dominated, and female researchers are totally absent from positions as permanent and associate professors. This group sets the premises for our leadership, strategy, research, culture, and recruitment. The permanent top positions are few, qualification requirements are high, and competition is tough.

By participating in this program, we aim to contribute with experience and new knowledge, and to benefit from others' ideas, knowledge, and experience. Our goal is for 1/3 of all new recruitments to be females. What hinders this today and how can we reach this goal in the future? We need to analyze today's situation, and work on change processes to raise everyone's awareness, clarify requirements and expectations, and take specific measures on all levels at QuSpin.

We have few female candidates and applicants. We need to understand how we can make an academic career at QuSpin more attractive for women. We have several female researchers with the necessary competence and personal skills whom we want to help qualify for future top positions. Mentoring and further developing their career plans, competence, and individual skills are important tools to reach this goal. We want to actively communicate and share experience from our project.

Our Center Director is responsible for the project, and the Center Coordinator is the project manager. The participants are the management group, a female senior researcher, and a female professor from the Department of Interdisciplinary Studies of Culture at NTNU. We wanted to draw on external expertise and establish a mentor group with female professors from national and international networks.

## QUSPIN BALANCE PROJECT GROUP



**Center Director/Professor**  
Arne Brataas  
(project owner, QuSpin/NTNU)



**Center Coordinator**  
Karen-Elisabeth Sødahl  
(project manager, QuSpin/NTNU)



**Primary Investigator/Professor**  
Asle Sudbø  
(QuSpin/NTNU)



**Professor**  
Vivian Anette Lagesen (Department  
of Interdisciplinary Studies of Culture/  
NTNU)



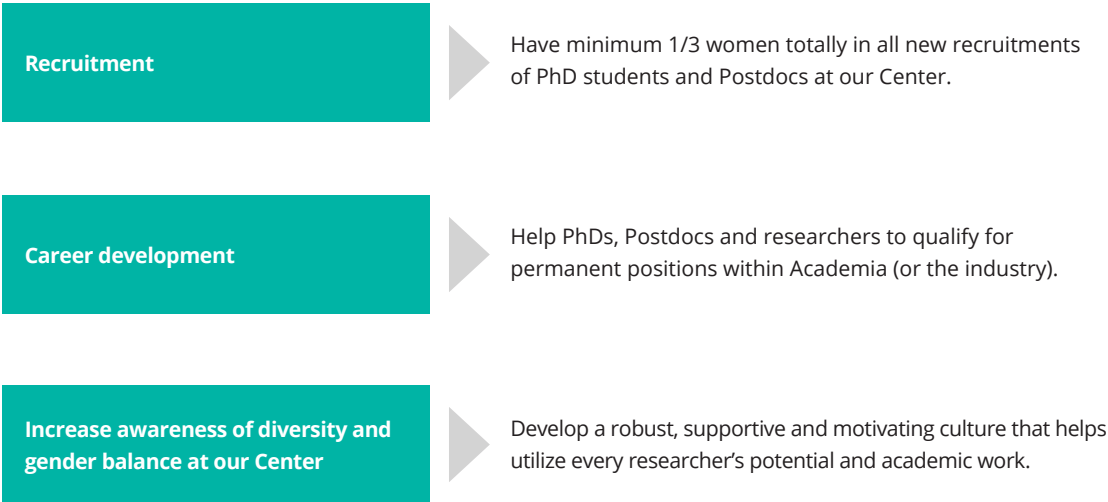
**Primary Investigator /Professor**  
Jacob Linder  
(QuSpin/NTNU)



**Senior Researcher**  
Dr. Sol H. Jacobsen  
(QuSpin/NTNU)

# QuSpin Balance Project Goal

Our main goal is to make a change in the following areas:



# Main Project Activities

These are the activities that we set out to perform in our project:

- Conduct internal survey on gender and gender balance at QuSpin with analysis and report.
- Organize and facilitate workshops and in-depth dialogues.
- Establish an international mentor group for our female researchers.
- Arrange QuSpin cafés for female students at the Faculty of Natural Sciences.
- Continuously work with career development, diversity, and competence development.
- Document the process.
- Write articles.

## Project phases

These are the phases in our project. Each phase builds on the experience and lessons learned from the previous activity.



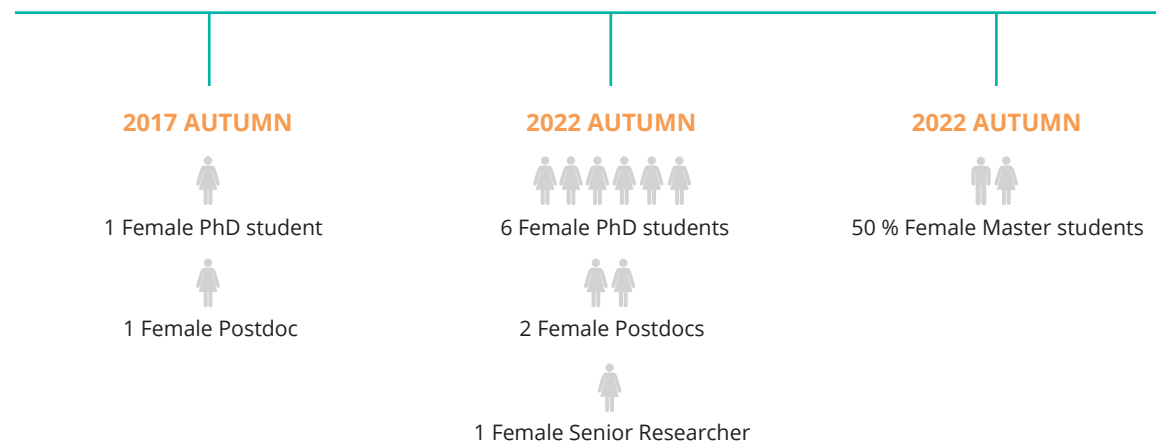
# Female Representation at our Center 2017-2022

In the beginning of our Center, in 2017, 100 % of our permanent scientific staff were men, we had one female Postdoc and one female PhD student.

In the beginning of 2022, we counted five female PhD students, two female Postdocs and one female senior researcher. In the autumn of 2022, we had one more female PhD student, and for the first time 50 % of our

master's students were female, eight female students in total. This is historical! Several of these highly qualified students applied for PhD positions at our Center in 2023. Unfortunately, we didn't have the budget to hire more than one female and one male PhD student this year. But luckily two more female students are starting in PhD positions outside QuSpin.

## TIMELINE - THE DEVELOPMENT OF FEMALE REPRESENTATION



Female researchers at QuSpin. From left: Atousa Ghanbari (Ph.D. student), Payel Chatterjee (Ph.D. student), Lina Grøvan Johnsen (Ph.D. student), Verena Brehm (Ph.D. student), Marion Barbeau (Postdoc), Anna Cecilie Åsland (Ph.D. student) and Dr. Sol H. Jacobsen (senior researcher). Postdoc Chi Sun and PhD student Therese Frostad were not present when the picture was taken.

# Background Stories from Female Researchers



At the age of 9, I moved from Norway to a small village in the highlands of Scotland. At 18, I moved to England to do an Honours degree in Physics with Philosophy, and I did not enjoy the first few years – I planned to get my degree and immediately do something else! However, pursuing my final year project kindled a love for independent research into quantum physics, and when it was awarded the thesis prize I realized I could make a useful contribution. I took a year away from study to work and consider my options and ambitions, save a bit of money, and expand my world view. I spent half the time teaching in Nepal, and the other half working in Scotland while writing thesis proposals and

applying for scholarships. Australia granted me a European Endeavour PhD scholarship, and I had a wonderfully fulfilling and fascinating time researching for a PhD in quantum theory. After a postdoctoral period in Freiburg, Germany, I had a 1-year old son and an Australian husband, and we moved to Trondheim so I could join QuSpin. My husband and I have been unusually lucky to have twice found research jobs in the same city as each other. Nine years later, I am a mum of three, and I have secured money to establish my own small group and explore my own questions in superconducting spintronics. It has become normal now for me to be in a minority at work in different places around the world, but I readily share both my positive and negative experiences with those who are interested, and particularly the new generation of students.

- Senior Researcher Sol H. Jacobsen



I am passionate about science in general but I fell in love with physics at a young age. My father and grandfather tried to discourage me from studying because what was expected from me was to get a job as fast as possible and start a family. The sexism from my family, classmates and teachers led me to have a very low self esteem. Indeed, from 15 to 21 years old, I thought that I was less intelligent than a male individual just because of my sex (I also have been explicitly told that I was less intelligent than a man because I am a woman).

Despite my lack of self-confidence and support from my family, I went on to do a Bachelor's and a Master's

in physics. After doing my Master's thesis in Sweden, I realised that I was perfectly capable of doing a PhD. Thus, I went to the Netherlands to start my PhD. It was not easy since I was the only woman in the group. In addition, the majority of the men were very misogynistic and absolutely not interested in learning about systemic social issues such as sexism and gender bias. The worst was that some of these men mistook my friendliness for flirtation and thus harassed and even sexually assaulted me. After my PhD I went to Norway to do my PostDoc. There, I had the great opportunity to give a talk about gender bias. Thanks to this experience, I learned a lot about the research on gender bias in Academia and I was also astounded about how extensive the gender injustice is! I hope that this talk I gave was helpful for my colleagues to better understand the mechanisms of gender bias in Academia.

- Postdoc Marion Barbeau



Physics has not always been the subject I wanted to study at university. In my home country, Iran, in order to get into a study program at a university, students need to take an entrance exam. As a result of this, the choice of study program often becomes a bit chaotic, depending strongly on the result of this test. I started studying IT, but I did not enjoy it so much and decided to try physics instead. In Iran, there are not so many job opportunities for physics graduates, leading to many ending up as teachers. My family was therefore somewhat skeptical, but with my stubborn character, I continued to do a master's in solid-state physics.

I finished my master's with good results with the plan of finding a PhD position in Europe. At that point, I was not so familiar with QuSpin, but looking at the topics that Arne and Jacob were working on, I decided it could be a good match for me. I began my PhD journey in September 2018 and faced many obstacles along the way. To begin with, I was one of the few women at QuSpin. In Iran, many of my classmates were female so I found the transition a bit difficult. However, I found a very good friend in my female colleague Payel and enjoyed many nice hot chocolate breaks with her discussing our work-related problems. I also faced problems such as paper rejections and the Corona pandemic, but I made it through. I graduated in March 2022, finishing one of the most wonderful experiences of my life. Prioritizing other aspects of life than just work, I decided to start a new chapter outside of university after graduation.

- PhD student Atousa Ghanbari



Several factors influenced my decision to pursue physics, including my love for the subject and the socio-economic circumstances I faced. While I also had a passion for engineering and neuroscience, I discovered that studying those fields would be financially burdensome. Considering the affordability factor, and my genuine interest in physics, I chose to pursue it. One of the reasons I gravitated towards physics was my enjoyment of spending time in the lab. As a child when asked about my ambitions, I always replied with, "I want to become a scientist". The idea of wearing a lab coat and working in the lab has always been very fascinating to me. I consider myself to be one of the lucky ones, as I always had good mentors to look up to. But my main inspiration remains my mother. She raised me as a single mother, even though she faced many harsh situations she never let those moments impact me.

Despite being a good student at school, I have always experienced impostor syndrome since my teenage days. So, during my bachelor's, I studied diligently and managed to qualify for a master's program. In India, pursuing a master's degree from a reputed university is challenging due to intense competition. While my master's program was satisfactory and enjoyable, I needed financial stability to support my ambitions of studying abroad for a PhD. After

completing my master's, I worked as a research fellow for a year and a half, earning the necessary funds to cover my expenses.

Being a research fellow allowed me to delve into the world of experimental research, a field that I truly loved and continue to be involved in. Eventually, I discovered a research position that aligned closely with my research interest and decided to apply. This decision marked a significant turning point in my life. Embarking on my PhD journey not only expanded my knowledge but also transformed me as an individual. I had struggled with social anxiety from a young age, which made it difficult for me to assert myself or voice my concerns when things were uncomfortable. However, witnessing confident and assertive women in my PhD program inspired me to overcome my social anxiety and become more assertive myself. Consequently, my PhD experience became a catalyst for personal growth, enabling me to evolve and develop into a different person. I must also mention that cultural expectations played a role in shaping my social anxiety. The cultural norm dictated that women should embody femininity, softness, and avoid speaking loudly. These expectations reinforced my social anxiety and introverted nature. Overall, my journey through Academia, particularly my PhD experience, has been transformative. It has allowed me to pursue my passion for physics, overcome personal challenges, and evolve as an individual.

- PhD student Payel Chatterjee



I enjoyed doing physics already in high school. We were a small class and few girls, but I found the subject interesting and didn't reflect much on the gender balance, we were mainly classmates. My final oral exam was in physics, and it was a very good experience. I think it was after that exam that I made the

final decision to study physics. I had a gap year at a folk high school between high school and university, spending a lot of time outdoors and trying different sports. It was fun and made me feel alive and recharged, but at the end of the year I was looking forward to start studying. I decided to go abroad during my studies, and did a master's in physics at Lancaster University in the UK. Those were four fantastic years. It was exciting to meet new people from all over the world, and great to be in a place surrounded by so many others who were interested in the same subject. I had nice flatmates, and good friends from the local church I attended and from my study program. We helped each other out if we were stuck on worksheets, and had many both study-sessions and waffle- or taco-nights. During this time I became more aware that there are generally more men in physics, but in my closest group of study-friends we were more women or approximately 50/50 women and men, and personally I never thought of it as a problem.

People were friendly and I felt like we were treated equally and treated each other similarly, independently of our gender. During my master's in experimental low-temperature physics I worked with one of my closest female study friends. We were part of a group where people helped each other out, and I felt supported by both our supervisor and other PhD students, Postdocs and Professors. Together we learnt a lot and had a lovely time.

Before I started studying I barely knew what a PhD was, but my master's supervisor encouraged me to do one, and during my last year of studying I strongly considered it. However, I was very uncertain about what I wanted to write about, and particularly where I wanted to be. In the end, I worked for a year as an engineer in a physics lab at the University of Stavanger, and started a PhD at NTNU in 2020. Here I was welcomed into the group from the very beginning, and feel like there is a culture for supporting each other and working together on projects that is rewarding for everyone involved. Overall it doesn't matter if most of my closest colleagues are men. What is important is that we want what is best for each other, and are honest and try to help each other when we can.

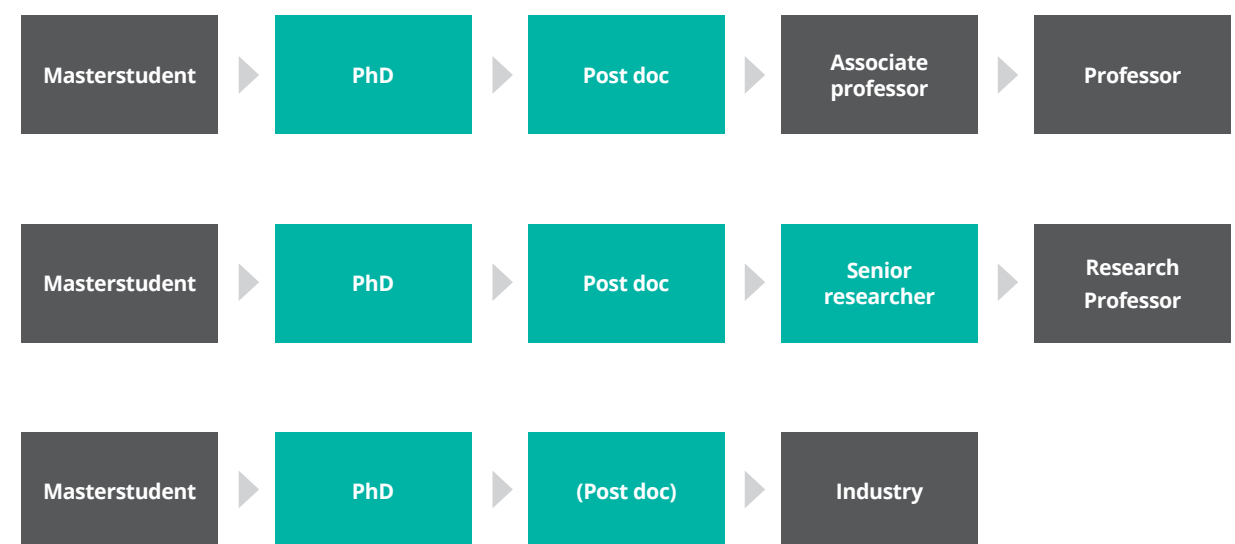
I think I have been lucky. I do physics mainly because I enjoy it. And the people I have worked with so far are inclusive and friendly, unified by a common interest in physics.

- PhD student Anna Cecilie Åsland

## Career Paths

### Career paths with basis in SFF QuSpin/IFY/NTNU

These are the scientific career paths at NTNU. SFF QuSpin has the hiring responsibility for temporary positions like PhDs and Postdocs. Hiring for permanent positions is the responsibility of the Department of Physics.



### The scissor point – a critical decision-making point in career development

NTNU offers measures like mentoring and start-packages to help both female and male researchers. But this is only offered to permanent staff, not temporary staff. We see that a critical point for both men and women when it comes to choosing to pursue an academic career or not, is moving from a PhD position to Postdoc position. The Postdoc position is the stepping stone on the path towards a permanent position as Associate Professor and Professor and where one finds the "scissor point" of continuing to pursue an academic career or not.

One might raise the question if NTNU should actively offer career support like mentoring also to temporary staff, like they for example do on campus at the University of Hamburg through their program "dynaMENT - Mentoring for women in Natural Sciences" designed for temporary staff like female doctoral researchers as well as junior professors, (junior) research group leaders and postdoctoral researchers.

# Internal Survey on Gender Balance and Diversity

Facilitated by Marianne Solem, Mobilize Strategy Consulting, and Karen-Elisabeth Sødahl, QuSpin

The survey was distributed to the following respondents:  
QuSpin: 11 professors/associate professors/researchers  
QuSpin: 25 Postdocs/PhD students  
Alumni: 20 individuals

The response was as follows:



| Group                                       | Number of respondents | Number answered | %    |
|---------------------------------------------|-----------------------|-----------------|------|
| Professors/associate professors/researchers | 11                    | 3               | 27 % |
| Postdocs/PhD candidates                     | 25                    | 15              | 60 % |
| Alumni                                      | 20                    | 9               | 45 % |

| Q40: What is your current position at QuSpin, NTNU? |    |
|-----------------------------------------------------|----|
| Male                                                |    |
| Postdocs/PhD candidates                             | 12 |
| Alumni                                              | 7  |
| Professors/associate professors/researchers         | 3  |

| Female                                      |   |
|---------------------------------------------|---|
| Postdocs/PhD candidates                     | 3 |
| Alumni                                      | 2 |
| Professors/associate professors/researchers | 0 |

The questions in the survey have been quality assured by the project group members, a representative from the Committee for Gender Balance and Diversity in Research (KIF) and NTNU's gender equality and diversity advisor.

We had a good representation amongst the temporary employees whereas the representation amongst permanent employees could have been better. The permanent employees representation and participation in the following workshops proved very good.

### Areas that we looked at in the survey:

- Employees: Dominant vs non-dominant groups**, including career possibilities, supportive and non-supportive factors.
- Organization culture** including cultural preferences etc.
- Competence management**: knowledge and understanding of equality/diversity/gender, different types of competence etc.
- Strategy and steering systems**: utilize diversity/gender with clear requirements and follow up on this.
- HR/recruitment processes and development**: recruit beyond representation (%) only.
- Leaders**: Move beyond "counting" culture.

It would have been interesting to look at themes like the employees' families and cultural background, but these types of questions turned out to be too sensitive to secure anonymity with so few respondents in the survey. These questions were subject for dialogue in smaller groups.

### Main findings

We will try to describe some tendencies we see in the survey. We consider the survey a type of employee mapping and are therefore not dependent on a higher number of respondents, since the information is not intended to generalize beyond QuSpin. The survey only reflects the respondents' views and is therefore only valid as a picture of the QuSpin situation.

We will attempt to give a summarized picture of the various categories in the survey with the intention to highlight inequalities connected to gender and position – the kinds of inequalities which stand out as possibly the clearest and most interesting to continue working with.

Overall, we think we have gained increased insight and knowledge on the following areas:

• **Leaders: Get past the «counting culture»**  
Here we see the importance of increasing access to talented candidates, and look at this with search committees, networking, and possible evaluation of "Excellence" (counting publications) versus other types of competence.

• **Employees: Dominant vs non-dominant groups, including career possibilities**  
Here we see how the majority evaluates competencies, what they prioritize, and what inclusion looks like, and that men and women have a slightly different view on what inhibits and what promotes career development. Establishing a family and mobility requirements are experienced as inhibiting factors for both genders, but mostly so by women. The low number of available permanent positions is experienced as inhibiting for both genders. Women feel a somewhat greater need for career support and networking than men.

• **Organization culture including cultural preferences etc.**  
Here we see various degrees of involvement and inclusion at the Center, and possible contours of how informal structures can influence networking and careers.

We were not able to research cultural preferences concerning diversity because of the requirement for anonymity.

• **Competence management: knowledge about and understanding of equality/diversity/females, different types of competence, etc.**  
Here we see emphasis on different types of competence depending on position and gender, experience, and development. Men seem to emphasize informal academic and social relationships in addition to academic results to a higher degree than women. Women seem to have more focus on academic achievements and the need for access to networks and financial resources.

• **Strategy and Management Systems: a strategy of utilizing diversity/women with clear requirements to abide to them.**

Here we see a lack of prioritizing strategy and career support, as well as limits as to what the Center has a mandate to do something about when it comes to temporary and permanent positions.

• **HR/Recruitment processes and development: recruit beyond representation (%) only**

Here we see a lack of active searches for female candidates as well as the importance of competence on diversity leadership in culture building and recruitment.

Within themes connected to **competence and career development**, we find differences in what men and women find important. Overall, men find social factors like communication and collaboration somewhat more important than women do. This is even higher with permanent employees, who are mostly men. In this group, we also see that importance is given to leadership skills and pedagogical qualities in addition to other social factors. When we look at the gender distribution between temporary employees, we can see that women in this group value social factors and skills lower than men. What women attach the most importance to is more connected to achievement by weighting the importance of grades and research skills higher. Taking into consideration that the seniors find the temporary employees' ability to interact with colleagues and supervisors important, we can call these social factors important competencies for a researcher's career development. Men also attach importance to get going quickly with research projects, find direction and collaboration partners, whereas women do not seem to find this particularly important.

Summarizing, we can say that gender differences connected to importance attached to cultural and social factors in the work situation are about men giving these factors more attention than women, and that this tendency increases at senior level. Since the senior level is represented by people who have mastered career development, and there is a higher degree of accordance between what they find important and what men at lower levels find important, we think it will be important to research if insight in this difference can be a source of development of measures in this field.

Within the theme of **hierarchy and organization**, all women find independent financing highly important. Only just under 40% of men find this equally important.

As for research competence and career development, both genders respond that they to a certain or to a high degree are being involved in new research projects. Of those who say they are not being included, 40 % are women and less than 5 % are men. Here, the way into new research projects can be an area to explore.

Answers connected to the areas of **organization culture, inclusion and diversity** suggest that women attach more importance to what can be done in the recruitment area as well as support given to supervisors and leaders for building a safe and inclusive culture. Under this theme, which can be said to be most directly connected to the theme for the project and the survey, it is interesting that the replies to the questions show the least difference between the genders' weighting.

However, both men and women attach highest importance to the obstacle of the low number of available permanent positions. Women value the establishment of a family and mobility requirements the highest. Diversity and gender balance is not valued especially highly by anybody. All women attach no or little importance to the level of diversity or gender balance. 40 % of them think that gender balance has little meaning, whereas 60 % find it not important at all.

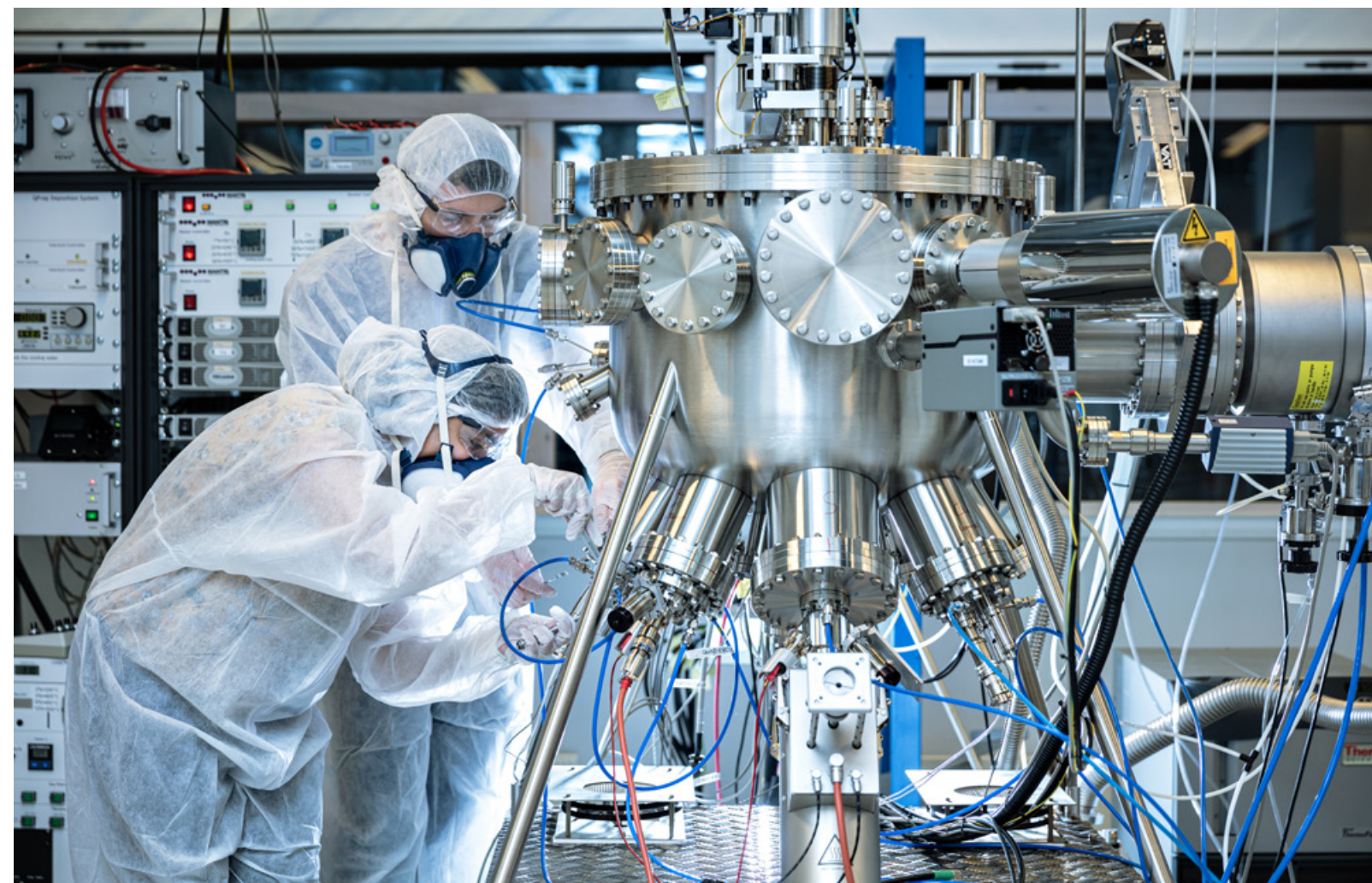
Both genders are concerned with having a safe space to share ideas, but almost double the number of women find this very important. As for financing, 80 % of the women have no experience acquiring funding, as opposed to less than 60 % of the men.

The measures at NTNU only apply for permanent employees and are therefore not relevant for our target group of researchers.

- **The social aspect**

Since what we can call social interaction factors are being weighted differently throughout, we would like to highlight the question of how to understand the meaning of the social aspect. Looking at working life research in general, it recently draws a line between arenas that are especially arranged for social activities on the one hand, and on the other hand the social activities that happen as an integral part of the interaction, what happens when we are dealing with our work assignments and how we manage to solve them (Stami).

If we assume that social factors are important in career development at the Center, a lower weighting of social factors will be part of what can inhibit a career



PhD students Payel Chatterjee and Matthias Hartl at work in the MBE lab.

development. Throughout the survey, women attach less importance to social factors compared to men. One possible interpretation is that these factors are not as important to women, but it is also possible that these factors are less visible to women. This does not mean that they are actively hidden by somebody or something (the culture), but they can nonetheless exist without consciousness from the majority or the minority culture. Is it up to the minority culture to have knowledge of what is important? Or can it be that women are more concerned with proving their academic competence and mastering, and therefore put more focus on that?

In the span between majority and minority, there can be interesting factors on which the majority culture and

leaders can increase consciousness. In the next round, the unconscious can become conscious, and the subtle can be put into words, shared and highlighted.

More details are available in a separate report.

**Comment from a RCN gathering:** At the last Balance Program gathering at the RCN, the question of the importance of informal networks in recruitment and career development was raised. And that this is an area which may not have been given enough attention by mentors or supervisors in the career development of younger researchers.

# In-depth Dialogues and Interactive Workshops

## In-depth Dialogues

Facilitated by Karen-Elisabeth Sødahl, QuSpin

We performed in-depth dialogues with our female researchers on the theme "Their personal journey". These dialogues were important as a starting point before the survey. They gave valuable input to the themes and focus of the survey.



## Interactive workshops

We performed three workshops with internal dialogues with everybody at QuSpin:

1. Workshop I: Results from the internal survey. Themes and challenges.
2. Workshop II: Focus on specific measurements.
3. Workshop III: Focus on change.

## WORKSHOP I

### Results from the internal survey. Themes and challenges.

Facilitated by Marianne Solem, Mobilize Strategy Consulting, and Karen-Elisabeth Sødahl, QuSpin

The participants contributed with many good ideas and experiences that could add to the career development and recruitment at our Center.

These were the themes addressed by the participants at the workshop as keywords on post-its.

**Diversity, different needs, equal opportunities, working environment, career development/ opportunities and leadership.**

### Diversity:

Gender vs ethnicity vs age vs what has bigger impact. Small pool of eligible female candidates already at master's level. Value different traits - diversity comes in many forms but must both be actively sought and nurtured to be utilized effectively. No common aim, no effective direction. Diversity

requires continuous action. More males in permanent positions - do we know why? Would be nice to have diversity if management is good. We must define "equality". What is diversity in the workplace - why should we have this (pros/cons) - how to handle diversity and how to get the benefits from it? Gender equality is a complex systemic issue which spans on multiple levels of society - in order to reach equality, one has to take measures which appear to be discriminating but are essential in order to make changes.

### Different needs:

Become aware of your own needs. Do women have different needs from men that make their career path more difficult? Different needs. Listening and talking to each other, having systems in place that allow for anonymous feedback. Needs concerning moving abroad - role models encouraging going out after completed PhD. Mobility is challenging for both genders - perhaps even more for females. What does «needs» mean, and how does mobility affect women's careers differently from men? Academia encourages extended stays abroad, not possible for everyone. Women in physics need female



role models. Mobility – not gender question, rather nationality. Informal feedback vs scientific achievements. At a small workplace like QuSpin, individuals really matter. Social exchange happens at work. Surprising that social interactions and networking is more important to males than females. Not enough to achieve equality at start of physics, as the permanent positions are dominated by men. Diverse groups need different measures to allow equality.

#### Equal opportunities:

Learn about the needs of others. Deep-rooted problem – how can QuSpin help? Understanding the cultural background, the needs of individuals – is it dependent on socio-economic background? Mentorship - aware of opportunities. Measures might seem unfair to individuals - might be needed - how do you use resources to solve problems of this kind. How can we judge equality if we apply different measures to everyone? To reach equality, unequal measures are required. Survey showed differences in perception: the social aspects and how we weight the importance of these vs performance. How do we define «equal»?

#### Working environment:

Social relation at work as the most important. Men focus more on social aspects - which ones and why? Easier to

continue because you are female, indirect insult: not as good as man. More clearly expressed by leadership - what is ok by in-depth conversations. Social interactions during and after working hours. Mobility vs gender balance. How does it manifest? Mostly men hired from abroad, or Norwegian women don't want a career requiring moving? How can we make sure the working environment treats everyone equally, taking people's differences into account? Why are mostly men applying for technical positions/ degrees?

#### Career development/opportunities:

Is it possible to identify social pressures that keep women out of Academia? Talk to someone further along in their career from a minority group about their experiences. Mobility requirement. Career development through mentorship more important for female researchers. Lack of permanent positions is a challenge. Encouragement in career development and job searching is important.

#### Leadership:

Low response rate in survey among permanent staff. Reflect on how important this is.

#### What could be done on the different levels at the Center?

##### On the individual level:

- Think about diversity: questions, measures, e.g. present article in Journal Club.
- How do we become aware of gender issues: talk about it like today. Read about it.
- How to create situations for having a dialogue.
- Work environment: what can each person do to contribute to a positive environment. For example, how your words affect other people's emotions.
- Different needs: informal discussions. Take a step back and observe.
- Diversity: acknowledge importance of topic. Figure out important sub-areas (not only gender), how does «diversity» interact with the work environment.

##### By the supervisors:

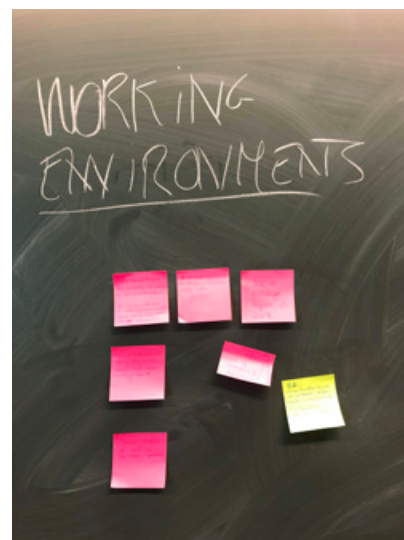
- Find out what their students want.
- Be aware of students' needs and well-being.
- Communication on development and needs.
- Recruit female master's students.

##### By the Management Group:

- More transparency regarding gender issues in hirings/decisions (career development).
- Show more interest in gender balance (low turnout /response rate (diversity)).
- Evaluate your presence/participation (and the importance of it) at the institutions.
- Find out what measures are possible to implement.

##### On the group level:

- Think about diversity: questions, measures. E.g. present article in Journal Club.
- Honest and direct communication (work environment).
- Encourage recruiting female master's students.
- Literature review on gender and diversity.
- Include everybody.



WORKSHOP II

Focus on specific measurements  
Facilitated by Karen-Elisabeth Sødahl, QuSpin

Here we asked the participants to focus on concrete measurements within recruitment, career development and diversity dimensions at QuSpin.

The following ideas came up on post-its, in a non-prioritized order:

**Recruitment**  
Broader advertising/searching committees, increased visibility, positive discrimination, training in diversity (recruitment committees), and duration of Postdoc positions (Norway).

**Career development**  
Access to conferences, summer schools, research stays, competence in writing applications for grants and positions, overview of vacant positions, network building/sharing, visiting guests, good contact with supervisor, and alumni day/experience transfer.

**Diversity dimensions at QuSpin**  
Inclusive language in the culture, work-life balance/ mental health, diverse personality traits when interviewing/in conversations/collaborations etc (introvert/extrovert, intuitive persons), different cultural backgrounds (learn about these, values, needs, direct/indirect communication), see the person (beyond skin color, gender etc.), different competencies (learn from others), similarity (too much focus on equal possibilities), and private space (to which degree should invisible diversity be part of our culture (sexual gender, religion etc.).



### WORKSHOP III

#### Focus on change

Facilitated by Signe Haver, 3B, and Karen-Elisabeth Sødahl, QuSpin

Change is central for our SFF QuSpin, and it is the goal of the QuSpin Balance project to increase the gender balance in top positions in Academia.

Examples of change at our Center are reaching the goal, navigating three different career tracks individually, facing changing demands in funding research, new expectations concerning basic and applied research, new members starting at our Center, welcoming new members at our Center, increasing gender balance and diversity etc.

By looking closer at what change means to us as human beings, how our different mindsets and backgrounds affect how we succeed in implementing changes, building new habits and behavior, and bringing awareness to both

sides of change (structural and psychological) we will gain insight to strengthen the actual execution of the different changes needed to reach the goal of the Center and the Balance project - individually and as a group.

**Transition** means being in the movement, coming from the known and moving into the unknown.

**Resistance** is a self-regulating mechanism that is triggered when we experience pressure in relation to changes to familiar habits and structures. It is a way of protecting ourselves from recognizing or experiencing things we find threatening. What is being protected? What is important?

The normal reactions to change can be avoidance, spontaneous or direct criticism, mental fog, humor, irony and sarcasm, quietness, aggression and/or sadness/feeling low. In the Balance Project at Matnat, UiO they established a project on "Resistance" to deal with the challenge of reaching gender balance.

#### Some input from the group work:

- Create a safe space
- Time – allow for perspectives
- Be able to express resistance
- Support challenges
- Value soft skills
- Appreciate/credit social and scientific contributions
- Talk to each other more, be aware of each other's perspectives and values
- Monthly gender balance-theme at lunchtime

More specifically on recruitment of master's students;

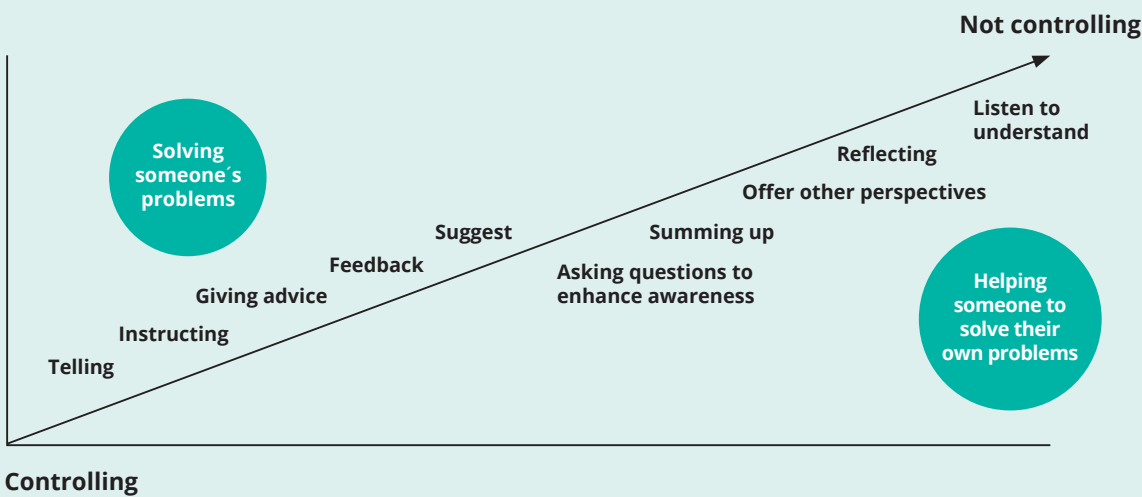
- Promote female role models in the early stages (physics)
- Recruit more female students
- Invite all students to the department or section before they choose a supervisor
- Place all master's students in the "master room" at QuSpin and make them feel included. Invite them to our workshops and conferences.

The project goal is to develop change – in recruitment, career development and building culture for inclusion and diversity...

1. What do we succeed in?
2. What do I find challenging?
3. Looking at the human side of change – what will I do differently?
4. What are our barriers/obstacles?
5. What do we need to do more of?
6. What do we need to do less of?
7. What can we stop doing?
8. What can I stop doing?
9. How can we support each other?
10. How can I support the QuSpin Balance Project?

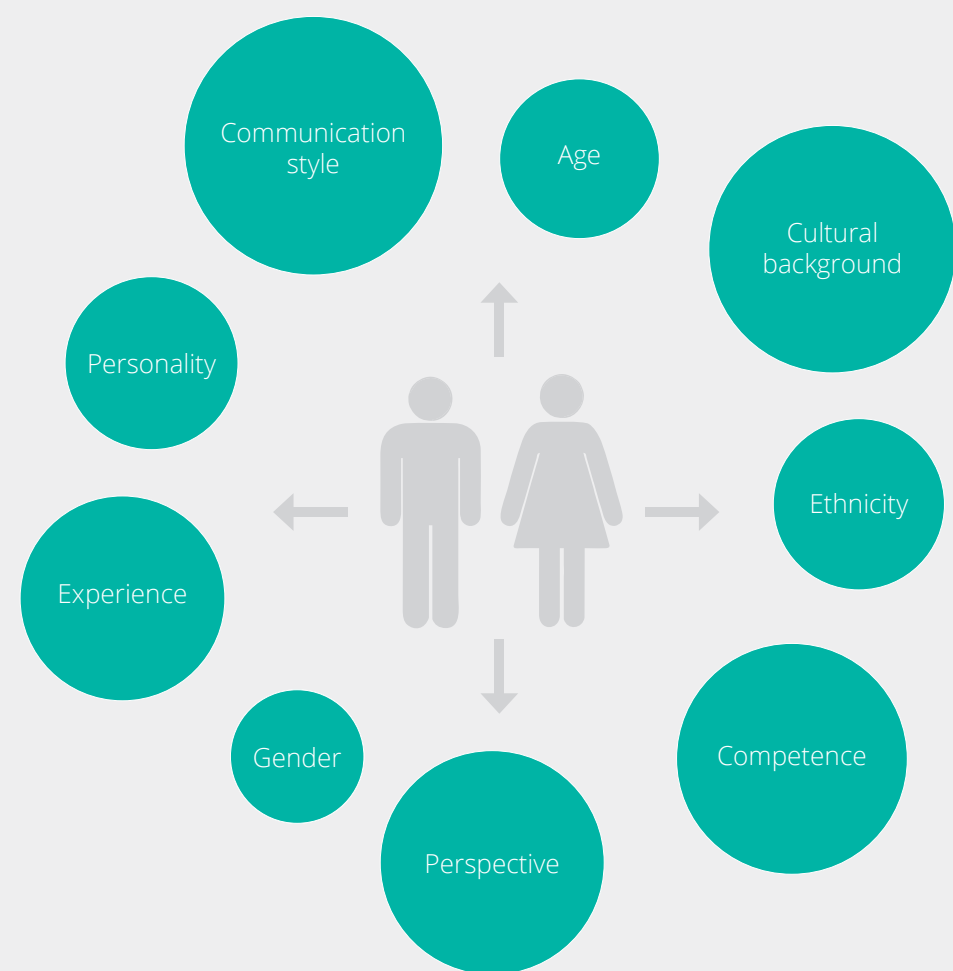


#### Different approaches to challenges

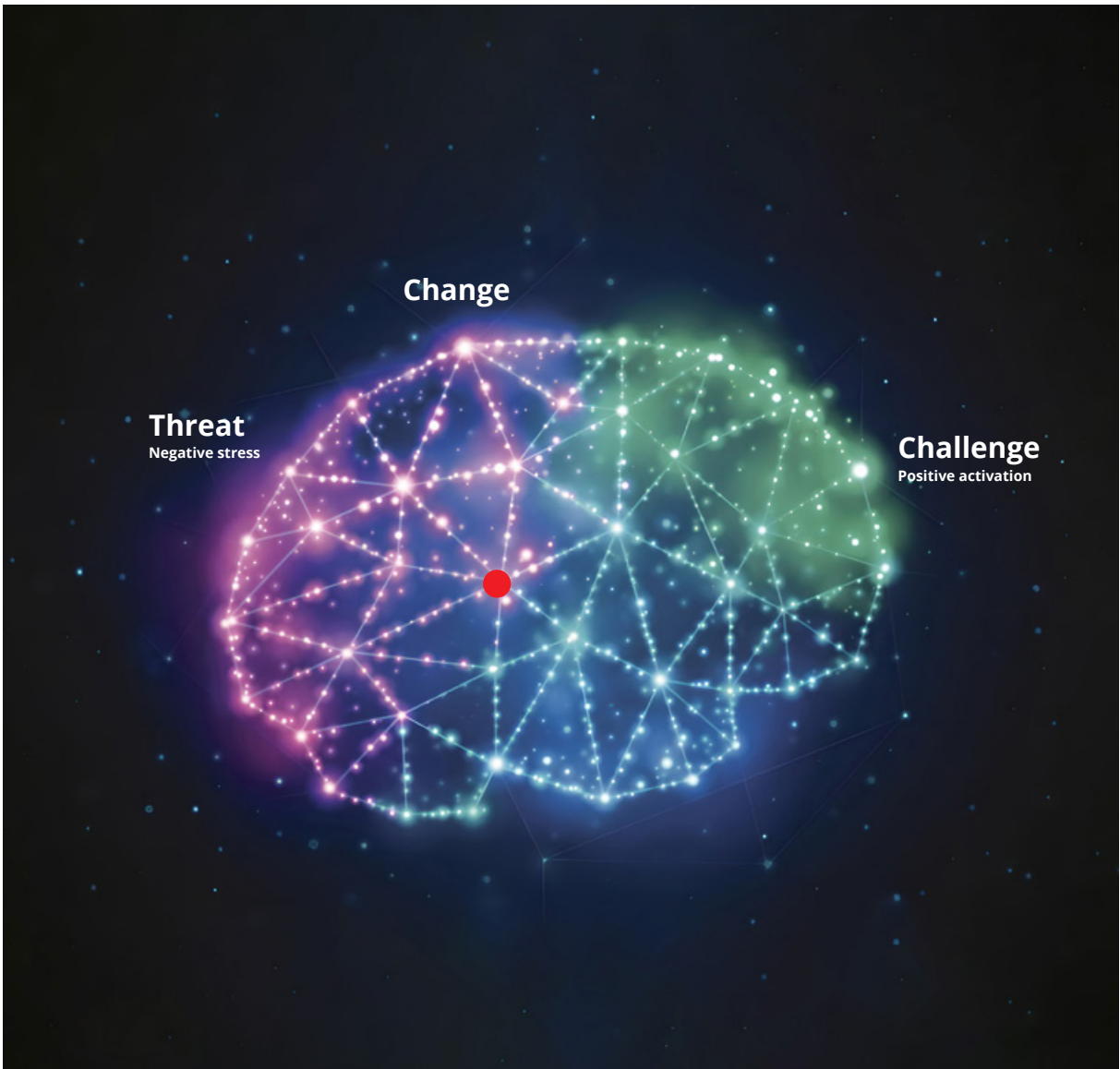


Source: Signe Haver, 3B.

VARIOUS DIVERSITY DIMENSIONS



Source Diversity Dimensions: Seema AS.

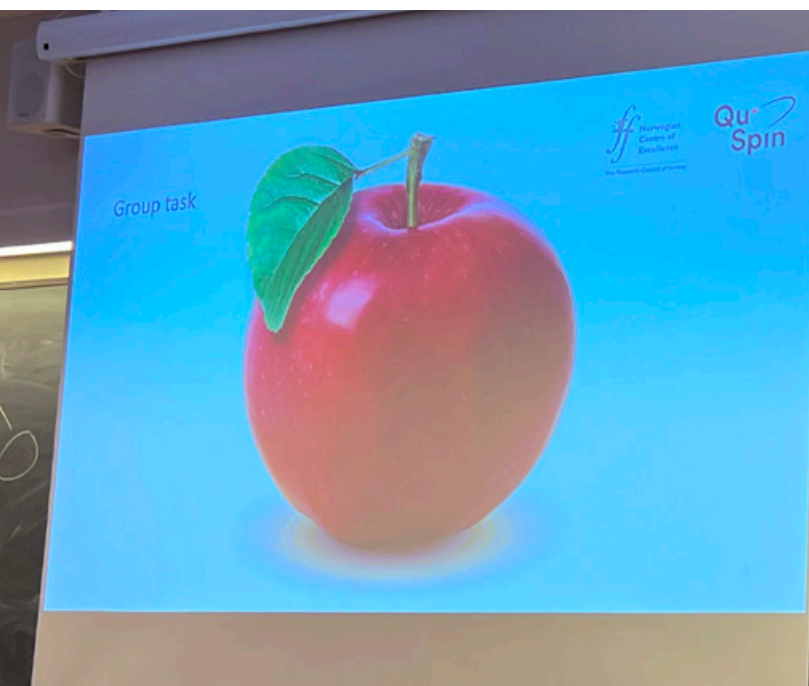


Source: Signe Haver, 3B.

Carl Rogers → Empathic listening  
 Edgar Schein → Humble inquiry  
 Carol Dweck → Mind set  
 Angela Duckworth → GRIT



L - listen  
 A - Await  
 R - Respect  
 S - Speak truthfully



|                 | 1     | 2     | 3     | 4     | 5     |
|-----------------|-------|-------|-------|-------|-------|
| all the same    | 0/3   | 1/5   | 0/3   | 0/4   | 0/3   |
| 3/4 same        | 0/5   | 1/8   | 3/5   | 0/7   | 1/6   |
| How many unique | 15/38 | 20/57 | 28/25 | 32/51 | 25/25 |



# International Mentor Group, Mentoring and Recommendations

We see the benefit of offering mentoring support to the female researchers at our Center. Six out of eight females have accepted the invitation.

The mentoring was offered to both researchers pursuing a career within Academia and in the industry. The mentors were invited into the project within this frame of work:

- Support the mentee according to their expressed need or what they agree to focus on.
- Perform a minimum of four meetings by October 2022.
- Participate in a meeting with mentors and meetings to share experiences autumn 2022.
- Host a physical meeting with the mentee visiting the mentor.



*My mentor gave a lot of incredibly useful advice on how to handle some situations. These mentoring sessions have been greatly valuable for me. Thanks to her, my transition from Academia to the industry was much smoother and more exciting.*

- Postdoc Marion Barbeau

*I have gotten a lot out of this. I held my first invited seminar for the "Oxide Superspin International Network", which is a collaboration between several universities in the UK, Italy, Japan, and South Korea. I also got the opportunity to visit Jason Robinson's group in Cambridge and take part in interesting discussions. Thank you to the Balance project for opening these opportunities for me!*

- PhD student Lina Johnsen Kamra

## MENTORS



**Professor**  
Jason Robinson, Cambridge University,  
UK (Chair QuSpin Advisory Board)



**Professor**  
Daniela Pfannkuche, Hamburg University,  
Germany (Member QuSpin Advisory  
Board)



**Leadership coach/therapist**  
Signe Johanne Haver, 3B, Norway



**Professor**  
Siri Fjellheim, Norwegian University of  
Life Sciences, Norway



**Professor**  
Kathrine Røe Redalen,  
Department of Physics, NTNU, Norway

## MENTEES



**Senior researcher**  
Sol H. Jacobsen



**Postdoc**  
Chi Sun



**Postdoc**  
Marion Barbeau



**PhD student**  
Payel Chatterjee



**PhD student**  
Lina Johnsen Kamra



**PhD student**  
Atousa Ghanbari

### Mentors and Mentees Sharing Experiences

We invited the mentors and mentees to a dialogue meeting to share experiences from the mentoring and learning points to continue to support female researchers in their careers.

#### Recruitment - the starting point.

Recruitment is the basis for increasing the number of female students and researchers into Academia. Here are some suggestions from the mentors on how to approach this.

#### Some suggestions from the mentors:

- Include soft skills into the recruitment committees. From counting to “real” results evaluating also collaborative, social skills etc.
- Biggest challenge to use the tools. Important to “educate” the committees. The leaders are not aware of the available tools that can be used.
- Aim for gender balance in the committee. Counting is not necessarily opposed to quality and impact.
- It is an ongoing process in the rest of the world to have people not clinging to the same old mindset when recruiting. Form a practical set-up and establish a climate where people feel welcome and comfortable.

#### The mentoring process:

##### Seen from the general perspective.

*The mentor and mentees relation: Experiences with in-house or external mentor.*

*The starting point, needs, getting to know each other, interaction and meetings.*

### Here are some experiences from other universities and organizations in Europe:

#### University of Hamburg, Germany

A program called "dynaMENT - Mentoring for women in Natural Sciences" has been established as a cooperative project of DESY and MIN faculty of Universität Hamburg, supported by the two clusters of excellence “CUI: Advanced Imaging of Matter” and “Quantum Universe”. It is designed to accompany female doctoral researchers as well as junior professors, (junior) research group leaders and postdoctoral researchers through an important phase of their career development. The program offers highly

confidential one-to-one mentoring sessions, networking events, and trainings concerning professional and personal development as well as raising the awareness of do's and don't's in the working environment.

#### Cambridge University, UK

Mentoring of early career faculty, postdoctoral researchers and postgraduate students has, in general, been unstructured and uncoordinated in the past. Mentorship and mentoree training in conjunction with coordination support from the university are, however, having a transformative impact on the well-being and success of our researchers. The additional support of an external mentor in a related research field could further underpin the positive impact of mentoring. Improving researcher diversity including gender within Universities requires much more than successful mentorship – it requires a willingness from all University members to work together to improve the research culture – the norms, values and behaviours of researchers and the research system are fundamental to research success and increasing the benefits of research to society.

#### Norwegian University of Life Sciences, Norway

There have been two career developing programs for young talented scientist for all genders, both including mentoring. It is unclear if the mentoring actions in these programs have had an effect in increasing gender balance. There have also been activities directed towards female staff like support in career development, CV writing and funding for travels and writing workshops. These activities likely have had a positive effect on gender balance in permanent academic positions. In general, there is a need for more focus on how to develop the relationship between mentor and mentee.

#### 3B, Norway

It is important to focus on creating the alliance in the mentorship – not only in the scientific perspective but even more on the human side. What does it take for female researchers to pursue and stay in Academia, or leave Academia to pursue a career in other sectors?

#### The mentoring process:

##### Seen from this QuSpin Balance Project experience

*Did you identify individual needs (e.g. on recruitment, career development, financing, building network, diversity and inclusion, self-confidence, work-life balance, other). Hindrances and opportunities for the mentee and the mentor in this process*

The mentees had different needs. They had a physical

meeting with their mentor. Issues that were addressed were individual depending on the phase in their career development, but they also had challenges in common.

#### Some issues that were addressed:

- What should be one's academic priorities in pursuing an academic career, and how to combine this with family life?
- How to balance research opportunities and challenges with the balance of professional and personal life?
- How to make the transition from Academia into the industry; writing applications and being prepared for a different working culture from Academia?
- How to handle a new role in a new working environment and to tackle challenges in a good way.
- Having support in the career development process and to increase visibility in the research community.
- Writing job applications in Academia and working on extending the research network.

### What will you advise QuSpin to continue to focus on to help support female researchers on their career path?

#### Here are some suggestions:

- Continue the mentoring program, for both females and males.
- Have a standard mentoring program with an official structure.
- Have a budget for this program.
- Have both internal and external mentors.
- Have members from our Alumni group as mentors in addition to others in our network.

“Improving researcher diversity including gender requires a willingness from all University members to work together to improve the research culture - the norms, values and behaviours

- Professor Jason Robinson

# QuSpin Cafés for Recruiting Female Students



*Written by Dr. Atousa Ghanbari*

We organized three cafés for female students in May 2022, but the fourth café had to be cancelled due to ongoing exams. We had twenty-four participants, with the majority being from the FYSMAT 2nd year.

The café program included the following activities:

- A presentation by one of our female researchers, sharing their personal journey into physics and discussing their plans for the future.
- An open dialogue with the students on the factors that either support or hinder their choice of pursuing further studies in physics.
- An introduction to QuSpin, featuring various work opportunities in academia and industry. We also provided information about supervisors at QuSpin.

## Why continue studying physics?

During the group discussions, some of the students brought up reasons why they got interested in physics and what motivates them to continue studying it. These include:

**Problem solving:** General development of problem-solving skills, as well as the satisfaction of learning how to solve particularly difficult problems.

**Challenging yourself:** Some students found it rewarding to challenge themselves by studying physics, which they considered a difficult topic.

**Interesting and enjoyable:** Obviously, an important motivation factor for picking a study program at university is that you find the field interesting and the associated work enjoyable. For some students, physics was found to still fulfil this requirement.

**Following their friends:** The students stated that an important source of information when picking their study program was friends who were already studying.

When making their choice, several of the students had been inspired by friends who were having a positive experience studying physics. When choosing whether to continue studying physics, influence from friends was also mentioned as an important factor.

**Environmental issues:** Many students were concerned with environmental issues such as climate change and pollution. A motivation for studying physics was therefore that it might allow them to contribute to finding solutions to some of these important issues.

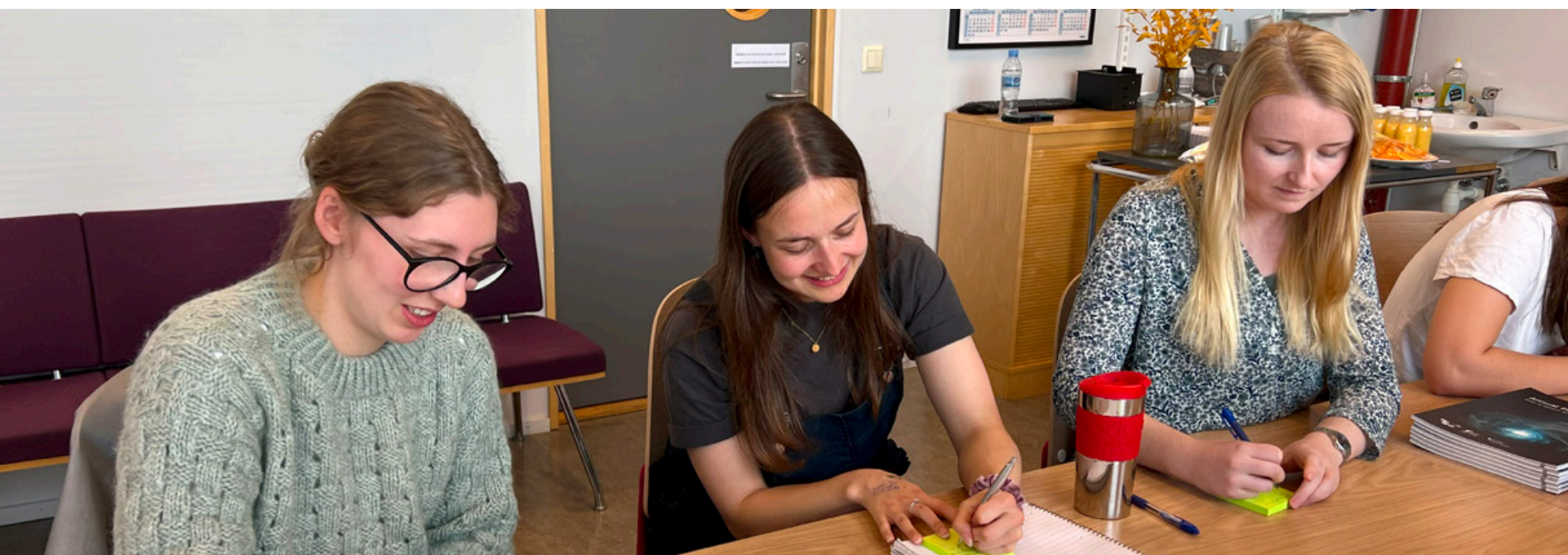
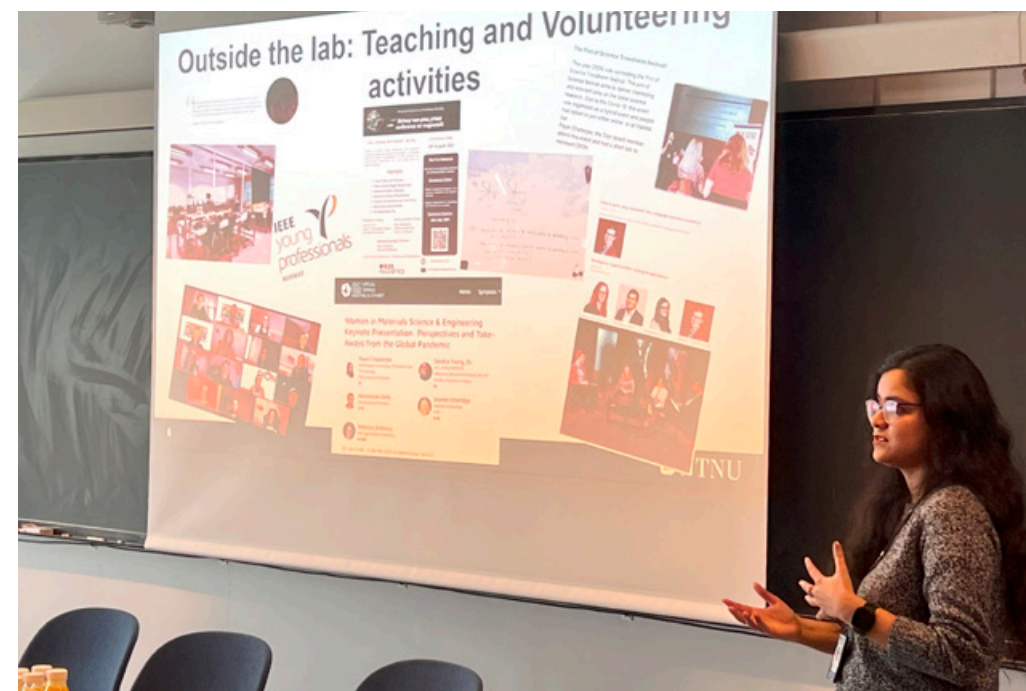
## Challenges

Although some students still had a positive attitude towards studying physics, some brought up reasons for wanting to stop studying it. The main problems that were pointed out were generally supported by all students. The problems can be categorized into three different points:

• **Not enough information:** Many students mentioned that they lacked information about future career opportunities and what directions their career might take if they chose to continue studying physics.

• **Difficult subjects and uninteresting labs:** Many students found that the first two years of physics studies entailed difficult courses that they did not always have the necessary mathematical background to handle. The lab courses were also often considered uninspiring and the lab work directed towards a given pre-defined result. This contributed to crushing their motivation for studying physics.

• **Social environment:** Some students felt that studying physics takes too much of their time and energy, limiting the possibility of having a rich social life. Some were also worried that their choice to study physics might lead others to view them as nerdy and less sociable.



# My Physics Stereotypes Revised

*A personal story written by master student Finja Tietjen*

Physics can give answers to the most fundamental questions about the world we live in, at least from a natural science point of view.

Physics has already helped us to understand the earth's gravitation. It will help us understand magnetism and can enable us to use electricity sustainably in a modern society. Knowledge about physics is not the result of one single person's effort. For centuries, people like you and me have shaped and developed the field of physics.

From my experience not everyone feels included in that "you and me". Not everyone is sure they can contribute anything to the field of physics. And some who are confident that they can do physics may wonder how you can do physics and still be a social human being? Despite this, I chose to study physics at university and luckily found out that we all form what physics looks like on a daily basis with our ideas, and with our sheer presence in this fascinating field. Let me tell you how I got to this insight and what I mean by that.

Different tools help people in physics search for the answers we are looking for. Some of the big tools you find at places like CERN or LIGO, while other tools are small like pen and paper. They still may help answer the same questions, for example how mass is generated. This question can be studied in a particle accelerator or with a piece of very „cold“ material which fits onto a desk. In both cases, there are teams building the experiment, looking at the results, and discussing possible explanations.

Researchers do both calculations and experiments. In the experiments a piece of material is studied to understand the quantum mechanics in it, and to understand what happens to the resistivity under different circumstances,

and to investigate the effect of geometry on materials on a quantum level. These experiments are complemented by calculations of predictions and for analyses. This way, the energy loss in normal electronics can possibly be explained.

What researchers do might sound difficult and the description does not give away a lot about everyday research life. When I started studying physics five years ago, I had this prejudice about physicist as a bunch of super intelligent yet socially awkward guys working behind closed doors, writing down „crazy equations“ on their own, or doing experiments no one outside might understand.

Over the years at university, I luckily found none of this to be true. First of all, the doors to offices are open and interested people with questions are always welcome. The equations developed during research might indeed look difficult at some point and quite some patience is necessary to solve them, but there always is more than one person working on it and there is always someone who can help with tips and ideas. The same team spirit is present in the labs where equations are put to a test and the need for new equations and tests can be discovered.

Although many of the things I was thinking about physics turned out to be wrong, there is some truth when it comes to the field being dominated by men. Most physics researchers and professors are male. Even among theoretical physics students there are more men than women. That needs to be changed. More diversity among people doing physics will yield more diversity in the ideas, also regarding new physics. My experience also tells me that there are way more women interested in physics than those actually studying it.

## **But where are all the women that are interested in physics?**

Being the only one super interested in science is also not necessarily something you want to be. Two characteristics sometimes mentioned about physicists - being socially awkward and super intelligent - is something that you might not identify with. At least I was confused when I realized that studying and really liking physics can be totally "normal" and you can still be a social and cool person.

It was also a little frightening for me to realize that there are so many intelligent people around at university. It made me question my own ability to ever be good in physics, and it made me think that it is necessary to be smarter than everyone else in order to do the most difficult, most advanced physics like quantum mechanics or theoretical physics. That is definitely not true, You and I can do that.



Finishing my master's in 2023, I know for certain that studying at university is giving every one of us the tools and the foundation to focus on whichever physics we want. We become professional learners and also good team workers. These two skills enable us to explore basically every problem that is given to us, whether it is questions about classical electromagnetism or abstract quantum field theory.

Together we - including you - can explore the questions that make us study physics and be part of expanding our knowledge of the world around us. It only takes one thing: The confidence that you can do it.

# Students in Physics-related Study Programs at NTNU

Written by Dr. Atousa Ghanbari

There are four different study programs directly related to physics at NTNU. After graduation, the students in these study programs can continue studying physics at either master or PhD level. The study programs are Fysikk og Matematikk (MTFYMA), Fysikk (BFY), Master of Science in Physics (MSPHYS) and Nanoteknologi (MTNANO). The study program Technical Physics (TF) is a specialization of the MTFYMA program, as discussed below.

Fysikk og Matematikk is a five-year study program. During the first two years, the students obtain a general background in physics, mathematics, chemistry, and information technology. At the end of the second year, the students pick their specialization subject among three different subjects: Technical physics (TF), Biophysics and medical technology, and Industrial mathematics. The students choosing TF are the ones who can do the work for their master's degree at QuSpin.

The students coming from high school can also choose a three-year bachelor's degree in physics, here referred to as Fysikk. After graduation, these students can continue studying physics through the two-year study program, Master of Science in Physics. These master students can also do the work for their degree at QuSpin.

Finally, students coming from high school can begin with studying Nanoteknologi. This program is also a five-year master's degree. At the end of the third year, the students can choose between specializing in one of the three subjects Bionanotechnology, Nanoelectronics, and Nanotechnology for materials, energy and the environment. Especially the students specializing in nanoelectronics can be of relevance for QuSpin.

For the time period of 2017 to 2021, we specifically asked Runi Elise Ertsås Nilsen at the Department of Physics to provide us with the number of female and male students starting the different physics-related study programs at NTNU. The numbers are presented in Table I.

| Study programs                           | 2017<br>F-M-P <sub>F</sub> | 2018<br>F-M-P <sub>F</sub> | 2019<br>F-M-P <sub>F</sub> | 2020<br>F-M-P <sub>F</sub> | 2021<br>F-M-P <sub>F</sub> |
|------------------------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| Fysikk og Matem-<br>atikk (MTFYMA)       | 72 - 85 - 45.8 %           | 67 - 80 - 45.5 %           | 64 - 78 - 45 %             | 57 - 99 - 36.5 %           | 59 - 104 - 36.1 %          |
| Fysikk (BFY)                             | 11 - 52 - 17.4 %           | 14 - 58 - 19.4 %           | 21 - 48 - 30.4 %           | 12 - 47 - 20.3 %           | 6 - 60 - 9 %               |
| Master of Science in<br>Physics (MSPHYS) | 9 - 23 - 28.1 %            | 3 - 12 - 20 %              | 3 - 17 - 15 %              | 4 - 23 - 14.8 %            | 7 - 19 - 26.9 %            |
| Nanoteknologi (MT-<br>NANO)              | 18 - 29 - 38.2 %           | 21 - 31 - 40.3%            | 26 - 26 - 50 %             | 18 - 32 - 36 %             | 29 - 34 - 46 %             |
| Technical Physics<br>(TF)                | 14 - 39 - 26.4 %           | 18 - 24 - 42.8 %           | 21 - 25 - 45.6 %           | 15 - 16 - 48.3 %           | X - X - X                  |

Some of the data from Table I is also presented in Figs. 1 (a)-(d). It is seen from Figs. 1 (a)-(b) that Fysikk og Matematikk has the largest number of, both female and male, students coming from high school. According to Samordna opptak, all three study programs starting right from high school typically have wait lists, meaning that the number of students is not restricted by interest. However, the engineering study programs Fysikk og Matematikk and Nanoteknologi are generally more popular and harder to get into than Bachelor in physics. That the students are more oriented towards the five-years master program may be because students graduating from these study programs receive a master's degree in engineering, which may be more attractive for the job market. The program Master of Science in Physics has the lowest number of students.

An interesting point is the comparison between the number of female and male students in these study programs. Fig. 1 (c) shows the percentage of female students in the four different study programs. It is seen

that in all four study programs, less than half of the students are female. The gap is much larger in the BFY and MSPHYS programs. The low number of females choosing a bachelors degree in physics after high school likely contributes to the low number of females in the two-year master program. The percentage of female students in the study programs Fysikk og Matematikk and Nanoteknologi is higher, amounting to around forty to fifty percent. Finally, Fig. 1 (d) shows the percentage of female students in Technical Physics. If we just look at this curve, it might appear that more and more female students are attracted to Technical Physics as their specialization within Fysikk og Matematikk, but this is not the case. Instead less and less male students within this study program choose to specialize in physics. While the number of female students has stayed relatively constant, the percentage of female students has therefore been increasing. The decrease in male students is clearly an important issue that requires attention, although it is not within the scope of the QuSpin Balance Project.

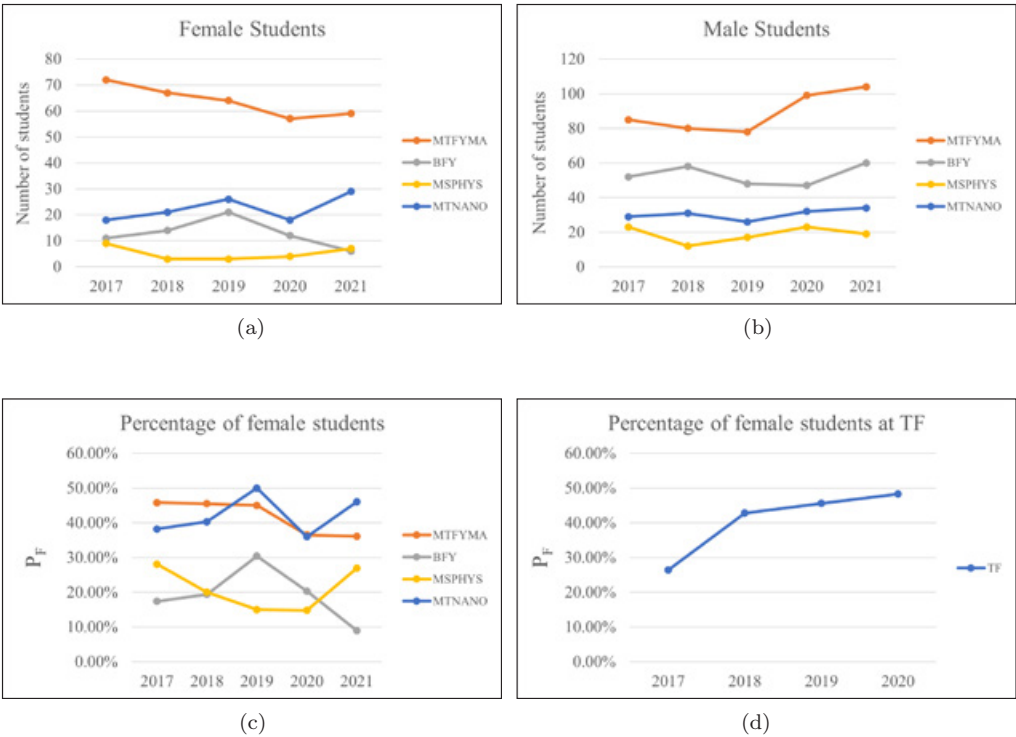


FIG. 1. The number of (a) female and (b) male students in different physics-related study programs at NTNU. The percentage of female students is presented in (c). Finally, the percentage of female students choosing the Technical physics specialization is displayed in (d).

# Other Activities

We also had some ad-hoc activities during the QuSpin Balance Project:

**Project on Students in Physics, by Dr. Atousa Ghanbari. “How to increase the number of female students within theoretical physics?”**  
“A description of the development of number of female students in our study programs at the Faculty of Natural Sciences, NTNU. And recruitment activities. The report is available on request.



**Journal Club: “Slaying the Seven-Headed Dragon: The Quest for Gender Change in Academia”**  
by M. van den Brink and Y. Benschop (2012). A presentation and discussion by Postdoc Marion Barbeau.



**Online seminar: “7 Steps to achieve Goals successfully”.**  
Concrete strategy examples from executives who were able to assert themselves successfully in a power arena. Recommendations on which strategies support your career development. Online seminar by Dr. Melanie Zimmermann, M.Sc. and Dr. Mona Haug, M.A., Executive Coach, CTM, Germany.



**Online course on Diversity.**  
The members of the Balance Project Group did an online course from Seema AS on the subject “The Value of Diversity” to increase our awareness on diversity. The course offered four themes: Diversity, diversity competence, diversity maturity and diversity leadership.



**NTNU centrally was part of french documentary: “La science a mauvais genre” (about gender balance in science).** French TV channel France 2. They interviewed researchers, students, and Toril Nagelhus Hernes at NTNU, including our French postdoc Marion Barbeau who also performed on cello.  
<https://www.tntendirect.com/FRANCE-2-en-direct>



# RCN Program on Gender Balance in Senior Positions and Research Management

The RCN BALANCE Program supports the efforts of research institutions in promoting gender balance in Norwegian research. New knowledge, learning and innovative measures will lead to greater gender equality and gender balance.

The Program Manager at RCN is Ingeborg W. Owesen (Forskings- og innovasjonssystemet) who has been extremely motivational and accessible, very knowledgeable and a great discussion partner. She is also the editor of the book “Kjønn og akademia – På vei mot BALANSE?” (Fagbokforlaget 2022) based on the projects in the RCN Balance Program.

## Background for the program

What are the most important challenges connected to gender balance and equality in today's research system?

The challenges related to gender balance and equality that the research system is bound to meet in the future will probably be closely connected to changes in recruitment forms, recruitment criteria, and internationalization.

- The way internationalization is designed today appears to have a very negative impact on equality and gender balance. For several reasons, mobility is easier for men than for women, a fact that is reflected in the numbers of international applicants and hirings, which show a clear male dominance in incoming mobility (Liestøl 2021)
- We would like to point out that some of the challenges are not on a general level, but are contextual and situational, which means that they can vary from one discipline to another or from one department to another, etc.

- The proportion of women in top positions is still a challenge, even if it steadily increases (by 1% annually over the past decades).
- As an important social actor, Academia carries a considerable social responsibility. Hence, it is fundamentally problematic that gender balance still has not been reached in key positions. This challenges democracy and the legitimacy of research and education institutions.

(Source: RCN)

## BALANCE work program

The work program provides an overview of:

- Challenges, objectives and priorities
- Anticipated results, impact and societal outcomes
- Available resources and budget

## Steering committee for the BALANCE program

- Knut Liestøl, Professor, Department of Informatics, University of Oslo (leader)
- Tor Grande, Professor, Faculty of Natural Sciences, NTNU
- Erik Litborn, Program leader, VINNOVA, Department of Health and Life Science, Sweden
- Ulf Sverdrup, Director and Researcher at NUPi, Oslo
- Ingrid Guldvik, Dean, Innland Norway University of Applied Sciences
- Gry Alsos, Professor, Nord University Business School
- Kristin Halvorsen, Director of CICERO, Oslo
- Karen-Lise Scheie Knudsen, Department Director, Ledelsens stab, University of Agder
- Thomas Michael Walle, Researcher, Museums of Sogn og Fjordane

## 6 RECOMMENDATIONS



### GET THE MANAGEMENT ON BOARD

Take responsibility! The involvement, willingness and clear ambitions of the management are critical for success.



### OPENNESS

Create an open atmosphere around calls for proposals, career paths and requirements – what it takes to succeed, what will be evaluated and how.



### CAREER PLANNING

Draw up a system for career development, and make this a mandatory component of employee performance appraisals.



### TARGET FIGURES

Map the current situation and set clear targets for what you wish to achieve.



### FLEXIBILITY

Find solutions that accommodate different ways of being a researcher, not just a single ideal that everyone strives to fulfil.



### KNOWLEDGE ABOUT GENDER EQUALITY

Decide whether this is expertise that your organisation needs to hire in or develop internally. Knowledge about gender issues and gender equality is essential to targeted, effective efforts to improve gender balance.

## 6 EXAMPLES OF MEASURES TO IMPLEMENT

### ANALYSE YOUR ORGANISATION'S SPECIFIC CHALLENGES

You need to find the problem areas before you can identify where to implement measures. Investigate the actual causes underlying gender inequality.

### ADVANCEMENT COURSES, PROFESSOR ASSESSMENTS AND PRE-ASSESSMENTS

Conduct advancement courses regularly, with pre-assessments of CVs and competence. Greater insight into what it takes to become a professor benefits women and men alike.

### MENTOR SCHEMES

Mentor schemes are a tried-and-true method for developing and transferring knowledge.

### ACTIVELY CULTIVATE THE RIGHT ENVIRONMENT

Take active steps to build an inclusive working environment and professional community that can accommodate the different needs of different life phases and promote balance between working life and personal life for all employees.

### PUBLICATION SUPPORT

Establish schemes for publication support, either in the form of writing workshops, or extra time and focus on writing. Publications drive a researcher career forward.

### SEARCH-AND-FIND COMMITTEES

Find and encourage qualified women to apply for relevant positions.

### Public regulatory authorities

**The EU Commission and the RCN have introduced requirements for a Gender Equality Plan (GEP) to get financing from Horizon Europe.**

The EU-requirement initially (from 2021-2024) applies to public sector bodies, research organizations and higher education institutes only.

The EU signals *inclusive gender equality*: Equality between women and men is seen in connection with other social categories and discrimination based on e.g. ethnicity, functional impairment, or sexual orientation.

In addition, the EU is concerned with inclusiveness in the sense of reaching out to all countries in Europe and increasing involvement from the private sector.

- The organization must publish a formal document on their website, signed by top management.
- The organization must allocate dedicated resources to implement the plan.
- The organization must gather gender-disaggregated data for all job categories and carry out annual reporting and follow-up.
- The plan must include internal competence development in the organization.

The RCN adjust their own requirements in line with the introduction of GEP (Gender Equality Plan) requirements in Horizon Europe. The requirements are adapted to Norwegian law, introduced for public bodies, research organizations and universities and colleges from 2022.

The same requirements are considered being introduced for private companies with more than 50 employees from 2023. GEP Requirements Gender Equality Plan (GEP) requirement.

### RCN Balance Projects 2017-2022

There are 21 Balance projects throughout Norway. They vary in focus, size, and scientific fields. See list.

Three of the projects are at NTNU Trondheim, including our QuSpin Balance Project 2021-2022. The other two are the IDUN project headed by Professor Letizia Jaccheri, and GENDIM headed by Professor Vivian Anette Lagesen. They generously shared their experiences when we started up our project. Vivian Lagesen also kindly joined our project group.

### Kjønn og Akademia: På vei mot BALANSE

#### Some interesting factors that were highlighted at the book launch:

- Norway is a society with a high degree of gender equality
- Researchers are concerned with work-life balance
- Many international researchers without family. They work 24/7 – surpass on merit lists and number of scientific publications?
- The focus from financing institutions on “Excellence and focus on counting the number of scientific publications and grants”: Are these the right main criteria for success? What kind of society do we want?



Illustration: Book presenting articles from the Balance Program and projects.

## RCN Balance Projects 2017-2022

1. Peace Research Institute Oslo (PRIO)
2. Norwegian School of Economics
3. The Arctic University of Norway (UiT) – Project Manager Kjersti Fjørtoft
4. Simula Research Laboratory – Project Manager Rachel Thomas
5. Innland Norway University of Applied Sciences – Project Manager Lars Petter Mathisrud
6. Østfold University College – Project Manager Camilla Gjellebæk
7. University of Bergen (UiB), Faculty of Mathematics and Natural Sciences – Project Manager Elisabeth Müller Lysebo
8. The Arctic University of Norway (UiT) – Faculty of Natural Sciences and Technology  
– Project Manager Anders Andersen
9. The Arctic University of Norway (UiT) – Faculty of Engineering Science and Technology  
– Project Manager Tanita Fossli Brustad
10. University of Bergen (UiB), Department of Geografi – Project Manager Judith Dalsgård
11. Høgskulen i Volda (Volda University College) – Project Manager Henriette Hafsaas
12. Norwegian Institute of International Affairs (NUPI) – Project Manager Kristin Marie Haugevik
13. University of Oslo (UiO), Department of Psychology – Project Manager Bjørn Lau
- 14. Norwegian University of Science and Technology (NTNU) – Department of Physics  
– Project Manager Karen-Elisabeth Sødahl**
15. University of Oslo (UiO), Faculty of Social Sciences – Project Manager Anne Julie Semb
16. The Arctic University of Norway (UiT), Faculty of Humanities, Social Sciences and Education  
– Project Manager Kenneth Rud
17. Nord University – Project Manager Ketil Eiane
18. University of Oslo (UiO), The Faculty of Mathematics and Natural Sciences – Project Manager Solveig Kristensen
- 19. Norwegian University of Science and Technology (NTNU), Faculty of Information Technology and Electrical Engineering – Project Manager Letizia Jaccheri**
- 20. Norwegian University of Science and Technology (NTNU), Department of Interdisciplinary Studies of Culture  
– Project Manager Vivian Lagesen**
21. University of Oslo (UiO), Centre for Gender Research – Project Manager Beret Bråten

BALANCE PROJECT REPORT PUBLICATION DETAILS

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Editors:

Karen-Elisabeth Sødahl

Text and illustration contributors:

|                        |                     |
|------------------------|---------------------|
| Karen-Elisabeth Sødahl | Atousa Ghanbari     |
| Arne Brataas           | Payel Chatterjee    |
| Asle Sudbø             | Anna Cecilie Åsland |
| Jacob Linder           | Finja Tieten        |
| Vivian Anette Lagesen  | Jason Robinson      |
| Sol H. Jacobsen        | Siri Fjellheim      |
| Marion Barbeau         | Daniela Pfannkuche  |
| Lina Johnsen Kamra     | Signe Haver         |

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Karen-Elisabeth Sødahl; 2-3, 4, 20-23, 25,30-31, 37-39.  
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Vivian Anette Lagesen; 7  
Kathrine Røe Redalen; 32  
Jason Robinson; 32  
Daniela Pfannkuche; 32  
Siri Fjellheim; 32  
Signe Haver; 32  
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Geir Mogen

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[www.ntnu.edu/quspin](http://www.ntnu.edu/quspin)

Center for Quantum Spintronics

Department of Physics, Faculty of Natural Sciences  
NTNU- Norwegian University of Science and Technology, 7034 Trondheim, Norway  
Address: Realfagbygget, E5, Høgskoleringen 5, 7034 Trondheim. Norway  
[www.ntnu.edu/quspin](http://www.ntnu.edu/quspin)



**CENTER FOR QUANTUM SPINTRONICS**

Department of Physics, Faculty of Natural Sciences, NTNU  
Trondheim, Norway

[WWW.NTNU.EDU/QUSPIN](http://WWW.NTNU.EDU/QUSPIN)