

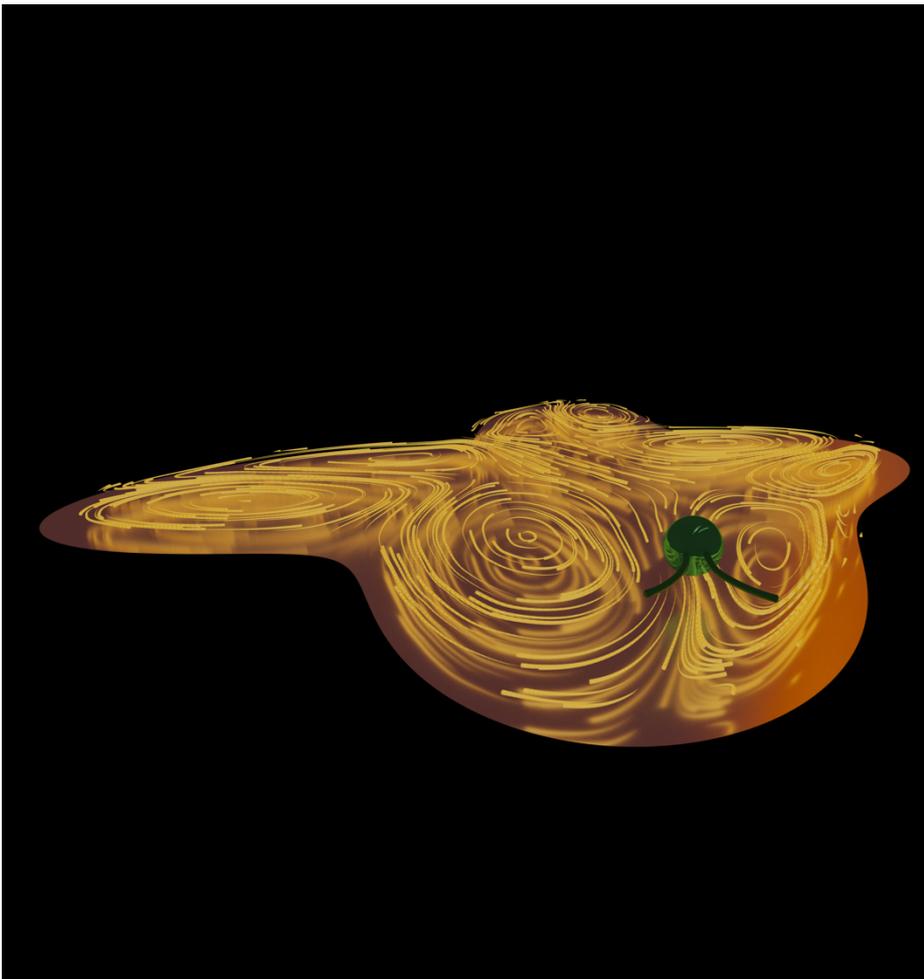
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**IOP** | Institute of Physics  
**Biological Physics Group**

NEWSLETTER

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**Cover Image**

The image shows probability fluxes computed from the trajectory of a single *Chlamydomonas reinhardtii* cell exploring a complex confined geometry. Such probability fluxes are a hallmark of nonequilibrium systems.

More details available at <https://www.pnas.org/doi/10.1073/pnas.2024752118>

Image credit: Esinam Dake, Jan Cammann, M. G. Mazza

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**Websites**

[www.iop.org/physics-community/special-interest-groups/biological-physics-group#ref](http://www.iop.org/physics-community/special-interest-groups/biological-physics-group#ref)  
[sites.google.com/view/biologicalphysicsgroupuk/home](https://sites.google.com/view/biologicalphysicsgroupuk/home)

**The Chair's commentary**

Dear Biological Physics Group,

I hope I find you well in these uncertain times.

What a genuine pleasure it is to reach out to you all with the first newsletter commentary since becoming the group's Chair. First, on behalf of the group, allow me to thank the former Chair Pietro Cicuta for his tireless efforts for our community. Pietro was hugely influential to the group, having started his tenure on its executive committee in 2010 as an 'ordinary' member, and then progressing through to be its Treasurer and then ultimately Chair. He was a fantastic advocate for several new initiatives in biological physics, and leaves the group in a healthy and enormously productive state.

May I also convey the huge debt of gratitude to the other members of the group committee who have now rolled off since our last newsletter, of Achillefs Kapanidis, Andela Saric, Peter Petrov and Ewa Paluch – their contributions were enormous and appreciated widely across the community.

It is wonderful to see the growth of the group, now totalling in excess of 1,000 members globally, and its continued outputs of focused workshops in multiple areas of biological physics research and teaching, as you see from this newsletter. In addition to these ongoing regular conference and networking activities I see opportunities in three key areas for us to make important impacts to the future of our flourishing community.

Our first target as a group I believe should be to work even harder than we have been on ensuring that the group's diversity continues to grow. The gender balance and age range of our group membership is already significantly more diverse than the majority of the IoP sub-groups. However, there remains a continual challenge to improve diversity, at all levels. We need to not only encourage diversity in the people who join the group, but also to reflect that at the level of our executive committee, in the organising teams of the workshops we put on, and in the people invited to speak at these workshops. This is absolutely essential, and something we can and should address constantly and make sure we do not sit on our hands but proactively promote.

Our second target I think should be to bolster the support for our early career researchers (ECRs). ECRs have a unique set of challenges focused around the need to engage in world-class, innovate research tensioned against the reasonable aspiration for job security. ECRs in the research area relevant to our group experience enhanced challenges relating to the high level of interdisciplinarity of the research field. In this newsletter I have drafted a concise survival guide for ECRs in our research field, which I hope may provide some helpful

pointers to ECRs in our community, and we are also supporting what should be a fantastic ECR grant writing and career development bootcamp later this year in Galway, Ireland 28-29 June, with support from our colleagues in the Physics of Life UK network (PoLNET) and the British Biophysical Society (BBS). In this bootcamp, experienced tutors will guide participants through key aspects of grant writing relevant to career progression, such as fellowship grants, and other focused aspects of career development, involving ample time for focused group writing sessions and so presenting a real opportunity to develop a competitive grant proposal by the end of the two days. We are limiting the number of participants to 35 with a view to really enabling focused ECR support, and have worked tremendously hard to open up access by being able to waive all registration fees and offering a staggering £140 bursary to every participant who requests it to help with travel and accommodation costs. Details available at <https://www.physicsoflife.org.uk/physics-of-life-ecr-bootcamp.html> - first come first served so don't delay!

Finally, our third target I am strongly believe should be one of ensuring sustainability of the research and teaching initiatives of our community. Challenges and opportunities of heterogeneity of the biophysics/biological physical/physics of life community are still apparent, with the community displaying a wonder breadth of expertise in its researchers and teachers. As a community, we experience a range of different start points, for example performing research to address physics questions demonstrated in biological systems or the address open biological questions using the tools and techniques of physics, but we largely end up in the same or very similar places. So how best to maximise the sustainability of this community in light of its enormous breadth? The UKRI "Understanding the Physics of Life" calls (see <https://www.ukri.org/opportunity/building-collaboration-at-the-physics-of-life-interface-2021-outline-stage/>) have resulted in ca. £33M of fresh research funds into the community. But out of a total of over 300 outline bids that were submitted to these calls only a handful of around 5% could be funded, despite the quality of the research being excellent - the demand for research funds currently far outstrips supply. We as an executive committee will make real efforts to work with funding stakeholders and aim to represent the interests of the BPG members to the absolute best of our abilities, to work towards a future sustainable research funding landscape for the whole of the biophysics/biological physical/physics of life community. One strategy that may prove particularly helpful here to encourage a greater number of co-badged conference activities across the different stakeholders groups of our community, so having the BPG work more closely with the BBS and PoLNET in particular in the future. Ultimately, if we can be sympathetic to the different needs of these wonderful individual communities but come together at key times and locations to speak with one voice then our lobbying power for cultivating future funds relevant to research and teaching in this area to the whole community may prove to be exponentially greater. A real key to success is likely to be that of maintaining all vested interests of the members of all of these groups across this community while still working with each other for the betterment of us all.

One activity that we really hope will catalyse these discussions across the community is a large Physics of Life 2023 conference that we are organising for 28-30 March 2023 (<https://iop.eventsair.com/physics-of-life/>) representing the diversity of the UK biological physics community, teaming up with our colleagues from PoLNET, BBS, and the Physics of Living Matter and Physics meets Biology biennial meetings. This in-person meeting will highlight the genuine excitement of research at the interface between physical and life sciences. In addition to some tremendous keynote lectures, the conference will feature parallel sessions on a wide breadth of topics, with contributed talks, ensuring a broad focus and inclusion of the best, most exciting science. The meeting is expected to continue beyond 2023 as a biennial event, demonstrating our underpinning level of committee to synergise our hugely diverse community.

I hope you enjoy this newsletter, and look forward to seeing each and every one of you at one or more of the brilliant events that our group is helping to organise on over the months to come.

*Prof Mark Leake, Chair of the Biological Physics Group, May 2022.*



**Professor Mark Leake** (Chair)  
University of York  
*Develops new biophysical instrumentation for biological questions*



**Dr Thomas Waigh** (Treasurer)  
University of Manchester  
*Biomolecules, and cells, biophotonics techniques*



**Professor Michelle Peckham**  
(Secretary)  
University of Leeds.  
*Cytoskeleton, molecular motors, super-resolution imaging.*



**Dr Marco Mazza**  
University of Loughborough  
*Theory and computer simulations across scales; mechanisms of complex matter organization*



**Dr Chiu Fan Lee** (Website).  
Imperial College London:  
*Universal behaviour in biology, protein amyloid self-assembly and pathogenesis, phase separation in the cell cytoplasm, active matter*



**Professor Mark Wallace**  
(cross representative with BBS)  
KCL  
*Mark's group builds artificial mimics of cell membranes*



**Dr Diana Fusco**,  
(Newsletter Editor)  
University of Cambridge  
*Modelling microbial evolution and cell collective phenomena*



**Dr Margarita Staykova**,  
University of Durham  
*Functional principles of biological membranes. Artificially designed smart interfaces*



**Dr Bartlomiej Waclaw**,  
(Website Editor)  
University of Edinburgh,  
*Interested in applications of statistical and soft matter physics to biological evolution*



**Dr Nirvana Caballero**,  
University of Geneva,  
*Theoretical Physicists, specialises in statistical and computational physics*



**Dr Timothy Saunders**,  
University of Warwick,  
*Quantitative Developmental Biologist*



**Dr Peter Adams**,  
University of Leeds,  
*Nanoscale Physics*



**Dr Massimo Vassali**,  
University of Glasgow,  
*Mechanobiology*

## New Members of the Committee

We'd like to welcome our new members: Nirvana Caballero, Timothy Saunders, Peter Adams, Massimo Vassalli and Diana Fusco.

**Nirvana Caballero** is a theoretical physicist who has specialized in statistical and computational physics. She develops advanced analytical and numerical techniques to treat the equilibrium and non-equilibrium dynamics of complex models for both, inert and living systems, in close collaboration with experimental colleagues. Recently, she has been developing models to study the dynamics of biological systems at multiple scales from cell membranes to individual and collective cell migration. Her expertise in high-performance computing techniques powered by general-purpose graphical processing units (GPUs) allows her to numerically emulate experimental protocols and analyze big amounts of data efficiently. After obtaining a Ph.D. from the National University of Cordoba (Argentina) she moved to the Bariloche Atomic Center as a CONICET postdoctoral fellow. Since 2018, she is a postdoctoral researcher and teaching assistant at the University of Geneva, which she joined with an Excellence Scholarship from the Swiss Government. She writes a science blog called "Complex Physics in 2 minutes" ([nirvanacaballero.org](http://nirvanacaballero.org)).

**Timothy Saunders** is an Associate Professor at the University of Warwick. Nowadays he is a quantitative developmental biologist, interested in understanding how organs are shaped during embryogenesis. He was trained as a theoretical physicist, with his doctorate on frustrated antiferromagnets. After his PhD, he shifted to biology, and now he leads a largely experimental group, where they utilise advanced imaging and analysis techniques to dissect the biophysical processes driving organ formation

**Peter Adams** is an Associate Professor in the School of Physics and Astronomy and a part of the Molecular and Nanoscale Physics research group (2015-current). This followed a Postdoctoral Research Scholar position at Los Alamos National Laboratory, USA (2012-2014), and PhD (2007-2011) at University of Sheffield. My research group investigates membrane protein and lipid assembly, with a focus on the specialized "light-harvesting" membranes that are involved in photosynthesis. We wish to understand, mimic and control the organization of membranes, inspired by the "light-harvesting" membranes found within plants (chloroplasts) and photosynthetic bacteria. The group takes a multi-disciplinary approach combining aspects of surface chemistry, nano/micro fabrication, protein biochemistry, fluorescence spectroscopy, atomic force microscopy (AFM) and fluorescence lifetime imaging microscopy (FLIM).

**Massimo Vassalli** graduated in Physics at the University of Florence where he later undertook an interdisciplinary PhD in non-linear dynamics and complex systems. He started his academic career at the National Institute of Optics (Florence, Italy), using optical and scanning probe microscopy to study the dynamics of biological microsystems. He moved to the Institute of Biophysics of the CNR (Genova, Italy) in 2009, where he founded the NanoBioScience lab. Since 2019 he is within the School of Engineering of the University of Glasgow as PI of the Centre for the Cellular Microenvironment. His main scientific interest is in understanding the mechanisms by which physical forces are transduced into biologically relevant signals (mechanotransduction), and their role in the homeostasis of key physiological processes whose alteration eventually leads to pathology or degeneration, such as in cancer or ageing (mechanobiology).

**Diane Fusco's** interest in biological physics started as a physics undergrad studying topological properties of the transcriptional network in budding yeast. After that, she was hooked and moved to soft matter and protein self-assembly for her PhD, under the supervision of Prof. Charbonneau at Duke. Unsatisfied with addressing questions exclusively on the computational side, she embarked onto a hybrid postdoc in Prof. Hallatschek lab at UC Berkeley, where she studied the evolutionary consequences of spatial range expansion combining microbiology and mathematical modelling. Now, she leads an interdisciplinary team at the Cavendish Lab where she investigates how evolution shapes phage-bacteria and bacteria-bacteria interactions to give rise to collective behaviour at the population scale.

And a huge thank you to our departing members, Andela Saric, Peter Petrov, Achillefs Kapanidis, Marco Mazza, Ewa Paluch and Pietro Cicuta. We miss you already!

### *Surviving Early Career Research and Beyond in the Physics of Life:*

A concise user guide

Mark C Leake<sup>1</sup>

<sup>1</sup> Departments of Physics and Biology, University of York, United Kingdom.

Early Career Researcher (ECR) development is a dynamic challenge that tensions the urge to perform ground-breaking research against an ultimate practical aspiration of establishing an acceptable level of job security. There is no typical career path for an ECR, least of all in the area of the Physics of Life or Biophysics/Biological Physics. Being explicitly interdisciplinary across the physical-life sciences interface presents more opportunities for a multiplicity of career trajectories through different home academic institutions and departments, as well as offering a broader range of alternative future career trajectories in non-academic sectors. That said, there are key common features, such as the transient nature of fixed-term postdoc contracts, the substantial research and domestic challenges that these present, and the often overwhelming pressures of the realities of competition in the job market. In this short article I outline the key challenges to ECRs in the Physics of Life and discuss simple strategies to manage and potentially overcome them.

#### Planning

The one overarching strategy that will best help an ECR to progress in the Physics of Life (PoL) is simply this: *have a plan*. There are multiple aspects of ECR life that are beyond your control; you cannot simply magic up a dream and fully tenured job, nor extend your current postdoc contract *ad libitum*, and the level of influence you can have over the research vision of your supervisor whose project you are currently engaged in can be variable that may become a tension to your pursuing your own independent research aims. But what you can do is at least consider what you ultimately want to do in life – know what your desired destination is, then you can try to work up a framework that may help you in getting to that point from where you currently are. Using something like a workplan or Gantt chart can be enormously helpful in this regard. These do not need to be intensely granular, but they need at least to have some description of a few focused activities, when these are planned to occur, and have a few checkpoints or milestones at around the  $\sim 2/3$  stage of each activity to allow you to critically gauge how well that activity is going or not, and if not then if you may need to consider pushing forward with an alternative activity as a mitigation plan. One easy way to mitigate against general risk of this nature is to ensure that there is some overlap at all time points in your plan between different activities so that this responsive migration between activities can occur.

One key feature of a plan is that it can, and should, be fluid. Knowing just how fluid to make it is not intuitive however, since the primary function of a plan is to act as a reasonably firm structure that can be followed. But a key time to review your plan is at each milestone checkpoint – use these not only to appraise how well a particular activity is progressing but also use this time to take stock of the global picture, and do not be afraid to adapt the plan as appropriate. This is particularly important in the instance of unforeseen external circumstances influencing the outcome and relevance of your planned research activities.

And consider having more than one plan, to cover different time scales. A long-term plan may be something that can be relatively light on detail but will take you from where you are now, to where you ultimately wish to be, such as a fully tenured academic job that could be several years down the line. A mid-term plan can potentially cover your current ECR post and the broad activities you have planned for this period, which can be both research and non-research based, and a short-term plan can be particularly relevant for ECRs who are engaged in multiple different activities and need to detail these more acutely and over a more aggressive time scale.

A particularly important feature of a PoL ECR plan is to structure in liberal periods for engaging your peers across physical-life sciences interface. This is invaluable, since a driving force for PoL research is ultimately to arrive at some level of truth about the natural biological world, but how you arrive at that truth, and how “true” the truth is when you get there, depends in no small part on where your research journey starts. You need to hone a “bilingual” ability of scientific understanding across the physical-life sciences interface, to be able to at least communicate the same basic ideas between physical sciences and biology. The most rewarding and efficient way to achieve this is to talk to people from across that interface, describe your research to them and get them to describe it back to you in their own words, and swap roles. This resonates with the core aims of Physics of Life research, but will also help you more palpably to, for example, rework your own ECR fellowship proposals to align with different funder remits, if the time is right for you to tackle these.

It sounds like a lot of effort when you are probably pushed for time as is, but a common reason for being pushed for time is the absence of planning and structured prioritizing. So think of a plan not so much as an option, but more as a lifeline.

### Strategy

Part of your long-term vision as a PoL ECR demands levels of strategic decision making - you need to make tough decisions about balancing competing demands on your time. There are aspects of the core research you are currently engaged in, but there are also other activities related both directly and indirectly to your research that may help you to differing extents to achieve your ultimate goal of job security. You need to be strategic and prioritise publications. A common pitfall of ECRs who wish to progress to ultimately running their own independent research team is to allocate too much time to activities that will take them away from publishing excellent peer-reviewed original research articles. For example, teaching work, excessive attendance at conferences and workshops, acting as an ECR rep on a range of different departmental/institutional/societal committees, and even outreach. These are all valuable activities, but the key is capture balance and appropriate targeting in all of these that will take away your precious time and slow down the process of you publishing excellent research papers. Although metrics that involve these additional activities are helpful for when you apply for your own research funds and/or tenured positions, the reality is that the most substantive, objective and quantifiable way to measure the research ability of an ECR is to look at their publication track record. So, you do need to prioritise getting those papers out.

But then you also need to be strategic in what papers you publish and how many. A single peer-reviewed higher impact and often complexly themed research article can have a significantly more positive influence on ECR fellowship proposals than multiple lower impact publications. By impact, think not of *impact factor* of the journal as such – funders that are likely targets for PoL ECRs to secure their own independent funding, certainly in the UK, now abide by the Declaration of Research Assessment (DORA) (1) which aims to encourage the “responsible use of metrics that align with core academic values and promote consistency and transparency in decision-making”, and one feature of this is to steer applicants and reviewers away from using journal impact factor as a mark of how good a particular research article is in that journal. Impact is better measured by the number of times a particular article has been found to be “useful”, e.g. the cumulative citations of an article. But such valuable articles will often have multiple and complex strands to them and so may often be cited for a range of different reasons by multiple different communities of researchers. Publishing fewer such high-quality publications is ultimately a better strategy for ECR career progression than multiple shorter, methodological/descriptive pieces, or reviews and book chapters. But such complex research studies often involve multiple collaborators, significant research challenge, and take more time to come to ultimately get published.

What can also make a positive difference is to ensure that you have clearly made a substantive contribution to a paper at the level of being listed as the first or joint-first author. Reviewers for independent funding and/or tenure will often look for clear evidence of an ability to *drive* the research. Having a small handful of cleverly targeted high-quality publications whose research you have clearly led in this way is more convincing evidence for independence and drive than having been a middle author on multiple papers, or indeed a senior/last/corresponding author on a lower impact article. Try not to fall into the trap of thinking that you need to show evidence of being a corresponding author at too early a stage in your research career, focus instead on leading high-quality research from the front, and make sure you finish it off to get it published. This may present challenges if your short-term postdoc contract associated with that research has finished, but there is nothing worse than the sorry tale of the biggest paper that you *almost* published.

It is sensible also to be strategic about identifying gaps in your CV and configuring ways in which to fill them. Such filling could include engaging in some of the non-core ECR activities that I suggested above to rein in on in favour of focusing on publishing great papers. But again, the key here is balance. Some very focused teaching activities is valuable. Targeted outreach events can be enriching. Directed attendance at conferences and workshops that showcase your own individual excellent research abilities and/or give you specific opportunities to engage potential mentors and champions of your research can be particularly valuable. There may also be learning gaps in your CV, areas of research where your skills and knowledge could be improved. The only way to learn more is to move out of your own research comfort zones. There could for example be opportunities in your current ECR post to learn new techniques through understanding members of your team or from a wider pool of collaborators. You may indeed benefit from identifying new research jobs specifically

because they contain some aspects that will force you to develop new skills. The key though is that you need to be proactive, you need to be the one to tell your supervisor, current or future, that being allowed to develop such new skills is of high importance to you.

ECRs often face challenges when it comes to generating “impact”, and being able to evidence this on independent fellowship and tenured-post applications. However, they are well placed in being agents of engagement with society, with outreach. These popular science activities in schools, museums, even pubs, can be enriching to both the audience and the speaker. But again though, balance is the key in knowing where to draw the line in not devoting too much of your finite time to any one activity. But participating in focused public engagement can be a fantastic learning experience and does demonstrate clear evidence of the ability to disseminate the broader impact of your research. One of the many beauties of PoL research in terms of outreach is that a lay audience has some intuitive understanding of “living things” in a way that other areas of the physical sciences are arguably harder to discern.

Being strategic in the timing of your own career advancement can also be helpful. For example, in the UK there are cycles of research and teaching assessment in academic institutions known as the Research Excellence Framework (REF) (2) and Teaching Excellence Framework (TEF) (3) respectively. These assessment exercises cycle typically over 5+ years, and since the amount of government funds allocated to academic institutions depends about how well they perform in these exercises the run-up to each assessment period traditionally sees many institutions advertising a greater number of targeted tenured posts. Playing the game in this way can verge on being soul-destroying especially if there is not a serendipitous fit aligned to your own domestic life into this *ca.* 5+ year cycle, but being at least forewarned is forearmed, and it does present opportunities to proactively explore potential job opportunities in departments which might not have been on your radar originally, such as considering the value of being hosted by a life sciences department instead of physical sciences, or *vice versa*.

Either way, some general level of strategic targeting of job/fellowship applications is helpful. Taking your time to look for the right targeted fit, as opposed to dispatching a multiple of speculative and unfocused job applications. An obvious strategy to follow here is to look in granular detail at the job description for a given research post. You will find that as a rule there are explicit criteria for each job, some *desirable* others *essential*. If you do not meet all the advertised essential criteria for a given position then an efficient short-listing panel will simply reject your application prior to any interview stage, regardless of how stunning the rest of your application is. Being flexible in regards to where to work can be very helpful, and in many ways moving from your current institution is one clear way to demonstrate independence from your current supervisor. But it is sometimes much easier said than done and dependent upon several domestic factors.

### Money

Ultimately, how you plan to progress your PoL ECR career depends on the money available to do that, how much and where from. A fantastic idea for your own independent PoL research that is not funded, is just that - a fantastic *idea*. So you need to learn not only how to develop and nurture your own independent research ideas, but also how to follow the money that will enable these research ideas to come to fruition. For UK PoL ECRs, the Engineering and Physical Sciences Research Council (EPSRC) (4) and the Biotechnology and Biological Sciences Research Council (BBSRC) (5) both offer different flavours of ECR fellowships relevant to PoL of typically 3-5 years duration. Other major charitable funders in this area include the Royal Society and Wellcome Trust (for research that is also biomedically relevant). But you need to acquaint yourself with all of the independent research funding schemes relevant to PoL, not just to focus on the long duration and more lucrative fellowships. These include several charities such as the Leverhulme Trust, the 1851 Commission, the Royal Engineering Society, as well as several focused smaller charitable fellowships with specific biomedical themes. These smaller fellowships are often fantastic springboards from which to develop a more compelling proposal for a larger research fellowship to come.

One significant challenge with PoL research, relevant to ECRs, is falling between the gaps of different funder remits. For example, EPSRC might potentially consider your ECR fellowship proposal too biological, BBSRC might triage it as too physical sciences oriented. Arguably, the situation between EPSRC and BBSRC is better now than it was a decade ago, but still there remains a challenge. Here, it is useful to hone a “bilingual” ability across the physical-life sciences interface. EPSRC and BBSRC always recommend discussion your fellowship application in advance with their admin team if there are potential issues of funding remit. However, an even better strategy is talk frequently to researchers from across the physical-life sciences interface about your

research ideas. This will ultimately help you to rework proposals to align with different funder remits. A major challenge in PoL research is to work from the often methodological/descriptive structure of physics themed proposals e.g. EPSRC into a more hypothesis-driven framework that is still viewed favourably by funding review panels of BBSRC. Here, you need to try to unpick what the specific key biological questions are to then motivate what research actions you propose to take to address them. This is a skill but it can be learnt from much practice, but in a nutshell it involves training your writing style to be structured more along the lines of “In order to determine X, I will do Y that will demonstrate Z...”

There is also value in demonstrating on your CV the ability to win, or assisting in winning, research funds. As an ECR there are not many opportunities to do this, but they exist. For example, EPSRC and BBSRC grants now allow postdocs who have contributed a significant amount of work into a grant proposal to be named as a “researcher co-investigator” on the award. This is great experience for the postdoc, and also serves as clear evidence to future reviewers of your potential to secure research funds. But even successfully applying for summer studentships, student internships and small pots of internal institutional funding can also serve this ultimate purpose, as well as giving you fantastic experience of grant writing in a relatively time efficient way and, if you then have worked with your supervisor to secure “your” student for a few months you get some invaluable experience at supervising.

### Support

Finally there is the need to secure support from others for whatever you plan to do in your future PoL ECR career. Using informal peer feedback can prove enormously valuable when offered – often seen by some as being, alas, a box-ticking exercise at the last stage of submitting a grant proposal, alternative early engagement with your peers in your research ideas can be really helpful to gain feedback and stimulate new strategies. It is can be enormously helpful to find independent mentors and/or champions of your research ideas, either through your current institution, or through strategically targeting leaders in your field of researchers at conferences or workshops to sell your ideas to them. The COVID pandemic has proved particularly challenging for ECRs in that regard in limiting networking at in-person meetings.

However, one additional resource for engaging with potential mentors and champions is to look toward appropriate networks and learned societies in the area of PoL, the three most relevant in the UK being the Biological Physics Group (BPG) (6) of the Institute of Physics, the British Biophysical Society (BBS) (7) and the Physics of Life network (PoLNET) (8). Signing up as members for all of these bodies can be an enormous investment in many ways for your ECR career progression, giving you access to a range of focused meetings and also a community that wants to really support you.

It is clear the mental health challenges for ECRs are prevalent in the PoL community, and establishing networks of support, such as through learned societies and networks in PoL, is one route to mitigate against these often hugely debilitating mental health problems.

It can seem dreadfully bleak at times as a PoL ECR, especially when you have less than 1 year remaining on your fixed-term postdoc contract, no concrete offers elsewhere, but a head brimming full of brilliant but perhaps slightly raw research ideas. But there is hope: *there is a wonderful community of PoL researchers in the UK who are genuinely here to support you, you just need to make the effort to reach out to them.*

### References

1. <https://sfdora.org/about-dora/>
2. <https://www.ref.ac.uk/>
3. <https://www.officeforstudents.org.uk/advice-and-guidance/teaching/about-the-tef/>
4. <https://www.ukri.org/councils/epsrc/career-and-skills-development/fellowships/>
5. <https://www.ukri.org/councils/bbsrc/career-and-skills-development/fellowships/>
6. <https://www.iop.org/physics-community/special-interest-groups/biological-physics-group>
7. <https://britishbiophysics.org/>
8. <https://www.physicsoflife.org.uk/>

*Mark Leake is the Chair of Biological Physics at the University of York and Coordinator of its Physics of Life Group. He is also serves on the management committee of the British Biophysical Society, and is Chair of the Biological Physics Group of the IoP and of the Physics of Life UK network PoLNET.*

## Meeting reports

### *Motility in microbes, molecules and matter (BPG and computational physics group) 6-7 Dec 2021, London (Hybrid)*

I was delighted to coorganise an interdisciplinary meeting “Motility in Microbes, Molecules, and Matter” which was held on 6-7 December 2021 in London. Tyler Shendruk (Edinburgh) was my invaluable coorganiser. Our aim was to cast together a group of physicists and biologists working on systems as different as cell motility in tissue growth and cancer, synchrony in flagellar dynamics, structural rearrangements within biofilm communities, nuclear motor proteins, and artificial microswimmers. If that was not enough, we also decided to mix advances in experimental investigations and novel computational methods to tackle these challenging, far-from-equilibrium problems. The result was a joyful (and controlled) chaos of scientific discussion. We had a superb selection of speakers (senior and junior) who discussed the role of motility at different length scales in both biological and artificial systems. We had 90 participants (62 in person and 28 remotely). This was one of the first meetings held also in person after the restrictions of the lockdowns, and it had a particularly high values for PhD students and junior postdocs who could present their results. In fact, a highlight of the 2-day meeting was the poster session, which saw lively discussions and nascent collaborations among the ECRs present. The success of the event, and the strong interest of the community in this meeting at the interface between physics and biology, theory and experiments, convinced Tyler and me to organise a second edition in the Autumn of 2022. Follow this space!

*Marco G. Mazza*

### *John Squire: Memorial meeting, 17 March 2022, Imperial College London and Online*

To mark the untimely passing of Professor John Squire, Fellow of IOP, in early 2021, a memorial meeting, with sponsorship from the IOP, was held on 17<sup>th</sup> March 2022 at Imperial College London, “Muscles and Molecular Structure”, to celebrate his life and work. John Squire had a distinguished career at Imperial College London from 1973 to 2006, highlighted in his obituary:

<https://www.imperial.ac.uk/news/216273/obituary-tribute-professor-john-michael-squire/>

The meeting was run as hybrid with nearly 50 in-person attendees and 140 online using Microsoft Teams. There were 3 remote presentations, 2 from New Zealand and a presentation from Kate Moody, Professor Squire’s daughter, on behalf of the family.

We were fortunate to be joined by 10 members of Professor Squire’s family including his wife, Melanie. Speakers gathered at the South Kensington campus included Professor Ken Taylor from Florida, USA, and Dr Anne Houdusse from CNRS, Paris and from all over the UK. The speakers gave moving comments and anecdotes of working with Professor Squire before delving into the latest cutting-edge research. Professor David Parry, co-author with John Squire of the famous paper on the tropomyosin switch in muscle, recalled that the order of their authorship “Parry and Squire” was decided by flipping a coin. Professor Taylor discussed how John Squire’s proposals from the early 70s, have only now with current technology been tested and proved to be right. The participants of the conference at South Kensington welcomed the opportunity to be able to meet in person for the first time since the last physical conference, the European Muscle Congress in Kent in 2019.

*Pradeep Luther*

### *Early Career Event. 8<sup>th</sup> December 2021 (Online)*

This was the second incarnation of the highly successful early career research event. Introduced by the Biological Physics Group’s Chair Mark Leake outlining the underpinning support the group has for early career researchers, the ~40 conference participants were treated to three fabulous sessions chaired by Pietro Cicuta, Nirvana Caballero and Mark Leake. These explored a wealth of fantastic and varied biological physics research from ~20 highlight motivated ECRs involving both experimental and theoretical methods across multiple scales from single molecules through to tissues and organisms, spanning both established and synthetic processes and materials. Some really transformative work and insightful questions and comments, and such huge promise for the future leaders in our field! The day was concluded with an open and well attended discussion panel focused on various aspects of early career research. A real pre-Christmas treat, and we look forward to the next iteration of this brilliant meeting next year!

The winner of the short movie competition was Sophie Meredith, from the Molecular and Nanoscale Physics Research Group, Leeds – you can see her movie here:

[https://youtu.be/3hHJm8\\_7pP4](https://youtu.be/3hHJm8_7pP4)

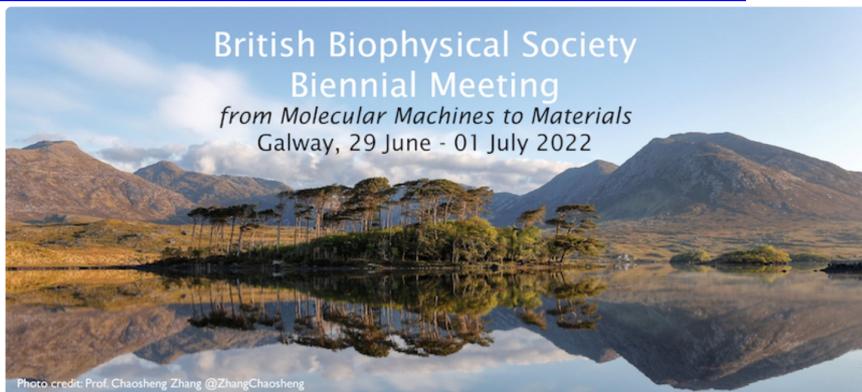
Prizes for speakers: £100 each: Natasha Cowley, Ran Tivony, Alex Payne-Dwyer, Sharareh Tavaddod, Henry Alston, Andrew Killeen, Roger Rubio Sanchez, Ivan Palaia and Andrew McMahan. Well done all.

*Mark Leake, Nirvana Caballero*

## Upcoming meetings

**BBS Biennial Meeting, Galway. 6-8 July 2022**

<https://britishbiophysics.org/posts/2022/2022-01-20-bbs2022/>



**BBS Biennial Meeting: from Molecular Machines to Materials, 29 June - 01 July 2022**

Including ECR satellite: a bootcamp to help Early Career Researchers to plan their grant applications. (28-29 June)

<https://www.physicsoflife.org.uk/physics-of-life-ecr-bootcamp.html>

**Athene Donald Retirement meeting:**

Joint meeting with polymer physics. (12-13 September 2022). Churchill College Cambridge. Organised by IOP Polymer Physics group, but also our group.

<https://events.iop.org/polymer-physics-meeting-retirement-conference-dame-athene-donald>

**Single-molecule bacteriology II**

Harden Conference in 11-14 July 2022 (5 day meeting) [Achillefs Kapanidis]

<https://www.biochemistry.org/events/87th-harden-conference-single-molecule-bacteriology-ii/>

**Physics of Life Meeting**

Harrogate 27-30 March 2023

<https://www.physicsoflife.org.uk/physics-of-life-2023.html>

<https://iop.eventsair.com/physics-of-life/>

(BPG/PoLNET/BBS/PoLS,)

**Physics of Life 2023, Harrogate UK**

## Ettore Majorana Foundation and Centre for Scientific Culture

# Active & Intelligent Living Matter

## 26 June - 1 July, 2022 – Erice, Italy



### Confirmed Speakers:

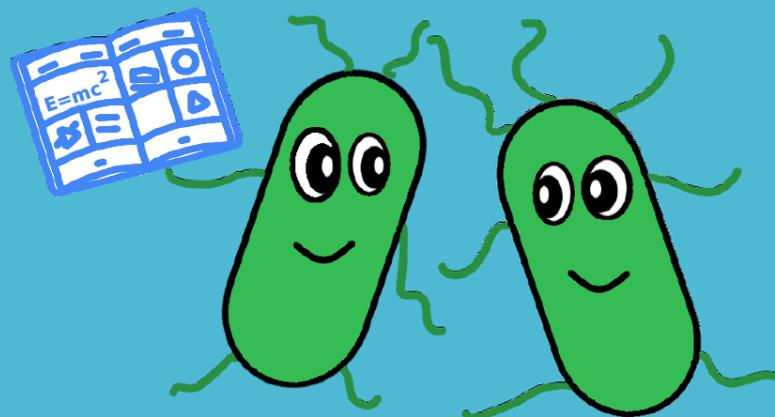
Philippe Bastiaens (Dortmund)  
 Clemens Bechinger (Konstanz)  
 Frank Chichos (Leipzig)  
 Cecile Cottin-Bizonne (Lyon)  
 Knut Drescher (Basel)  
 Laura Filion (Utrecht)

Gerhard Gompper (Jülich)  
 Linda Hirst (UC Merced)  
 Liesbeth Janssen (Eindhoven)  
 Tannie Liverpool (Bristol)  
 Corinna Maaß (Twente)  
 Daiki Matsunaga (Osaka)

Anupam Sengupta (Luxembourg)  
 Francesc Sagués (Barcelona)  
 Evelyn Tang (Rice)  
 Massimo Vergassola (Paris)  
 Giovanni Volpe (Gothenburg)

### Topics:

- Collective behavior in active systems
- Hydrodynamic interactions
- Tissue mechanics
- Microtubule dynamics
- Cellular migration
- Biofilms
- Applications of Artificial Intelligence



### Organizers:

Amin Doostmohammadi (Copenhagen) - Marco G. Mazza (Loughborough)  
 Tyler Shendruk (Edinburgh) - Holger Stark (Berlin)

