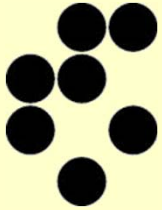
Univerza v Ljubljani
Fakulteta za matematiko in fiziko



Selected experience with applying for EU funding

Miha Ravnik

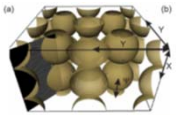
http://miha.ravnik.si

Faculty of mathematics and Physics, University of Ljubljana
Jozef Stefan Institute

2017

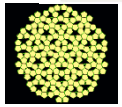
Our work and research directions:

Liquid crystal colloids and structures

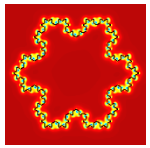


Nematic 3D colloidal crystals [Nature Commun. 2013; with I. Musevic, JSI]

Colloidal-nematic micro knots [Nature Mater 2014; with I. Smalyukh, Uni Colorado, USA]

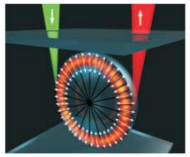


Quasicrystalline tilings from nematic coll. platelets [PNAS 2014]

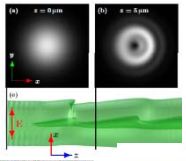


Fractal Nematic Colloids [Nature Comm 2016]

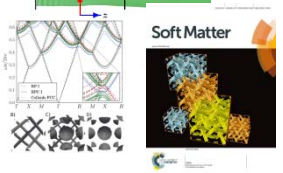
Soft matter photonics



Nematic droplets as tunable microresonators [Nature Photon. 2009 ; with I. Muševič, IJS]

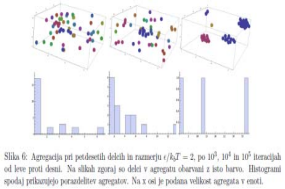


FDTD simulations of the flow of light along topological defects [PRE 2014, Opt Exp 2016]

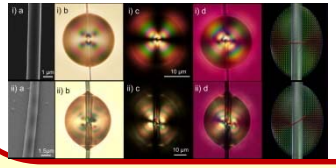


Blue phases as photonic materials [Soft Matter 2014, Soft Matter 2015]

Applications: Bio-motivated systems and sensors

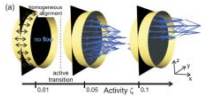


Prediction of protein aggregation in biopharmaceutical applications [applied project with Lek d.d. member of Sandoz]

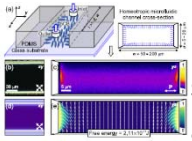


Nematic dropets as sensors for bio-fibers [PNAS 2016; with H. Godinho, Lisbon]

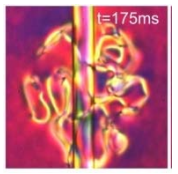
Fluidics of complex fluids



Active nematic flow in microchannels [PRL 2013a, with J. Yeomans]



Liquid cystal microfluidics for flow shaping [PRL 2013b, with S. Morris and J. Yeomans (Oxford); PRF 2016].

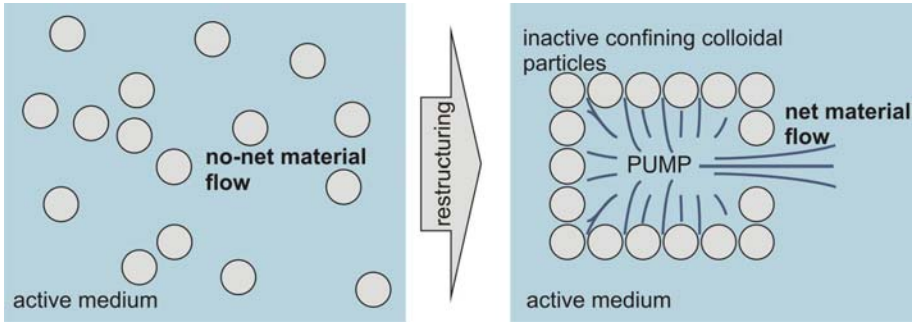


Kibble mechanism in the annihilation of LC defects [Nature Phys 2015; with I. Muševič, IJS]

MC Intra European Fellowship ACTOIDS

2010-2012 (2 years) at University of Oxford

Develop new materials - Active Liquid Crystal Colloids



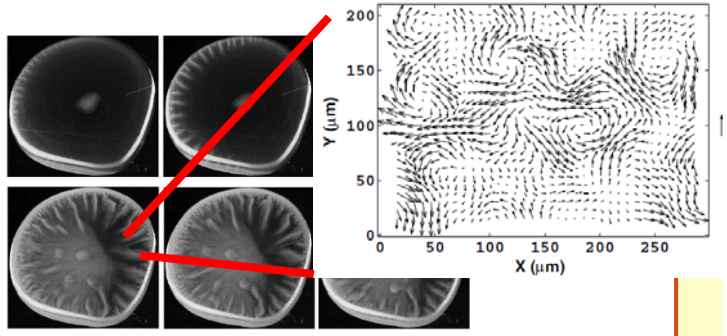


FIG. 1. Bioconvection in a sessile drop of diameter 1 cm. Top: images 5 min apart show the traveling-wave bio-Boycott convection that appears first at the drop edge. Bottom: images 2 min apart show self-concentration seen from above, beginning as vertical plumes which migrate outward.

Creating flow patterns and control over activity with the ordering of microscopic particles

The work covered and acknowledged with ACTOIDS was published in 9 scientific papers (1x PNAS, 1x Science, 4x Soft Matter, 2x PRE, 1x EPJE), 2 papers are submitted, and 1 in preparation.

Under ACTOIDS, the fellow gave 19 talks and seminars (17 invited,2 contributed), including: invited

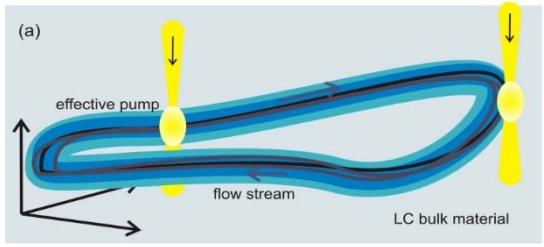
Personal Marie Curie Action grants have three main components: (i) Research project, (ii) Fellow, (iii) Host

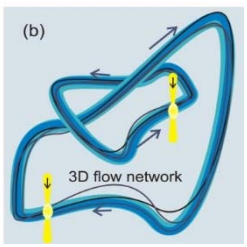
Gives novel layer of access to scientific excellence: science, skills, contacts, ethics and first level of independence.

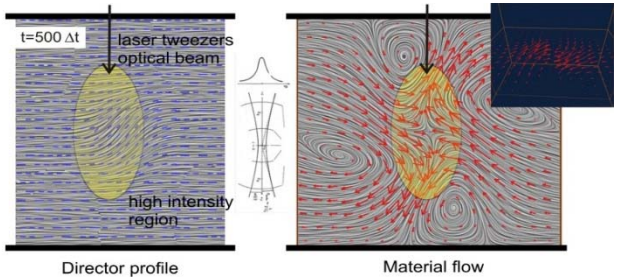
MC Career Integration Grant FREEFLUID

2012-2016 (4 year) at University of Ljubljana

Development of novel channel-free liquid crystal microfluidics







1. FINAL PUBLISHABLE SUMMARY REPORT

Comments:

This MC Career Integration Grant FREEFLUID explored vibrant multidisciplinary science of complex soft matter materials, as driven by fundamental questions of fluid dynamics, microfluidics, and complex fluids. The research was based on mesoscopic continuum theory and numerical computer mode crystal microflu and we believe of integration (a

PUBLICATIONS: Research results supported or partially supported by FREEFLUID was published in 17 scientific papers, including 1x Nature Materials, 1x Nature Physics, 2x PNAS, 1x Nature Communications and 1x PRL. For complete bibliography please see http://miha.ravnik.si.
TALKS: Under FREEFLUID, the work was presented at >30 invited talks by the researcher,

The grant supported my integration back from Oxford to Ljubljana:

- first paying for part of my salary
- then allowing me to hire a PhD student
- reference

Example of failed application:

- ERC – Starting grant application 2016 – rejected (score B)

Issue 1 - major:

Inproperly structured first (B1- 5 page) stage of proposal; this was all extensively explained in second stage (B2) text

Issue 2:

Reviewer scores are notably different

Example of our failed application:

- FET – Future and Emerging Technologies application – rejected

Multiple EU partners, including companies; the proposal was for soft matter application in photonics.

Negative points of the review – in-brief:

The proposed research will advance the field of soft matter devices significantly, but the results will likely not correspond to a technological breakthrough for commercial devices.

Future Emerging Technology umbrella of grants is the central grant scheme to develop novel technologies in Europe; i.e. to move science results to the proof-of-concept level of applications.

However:

- Issue 1: The success rate in these calls are of ~2%. A notable reason is the allocation of funds to FET Flagships (graphene, brain). How then open new technologies with so restrictive calls?

- Issue 2: The main criticism for our proposal comes from distinct industry. How then develop fundamentally disruptive technologies?

Consultants in grant preparation:

Using help from professional consultants for ‘big’ grant preparation has become in Europe a widely used practice.

Multiple companies, several also in Slovenia.

This is not the case according to colleagues from USA.

Mixed experience.

Use verified consultants who are experts for the targeted calls.

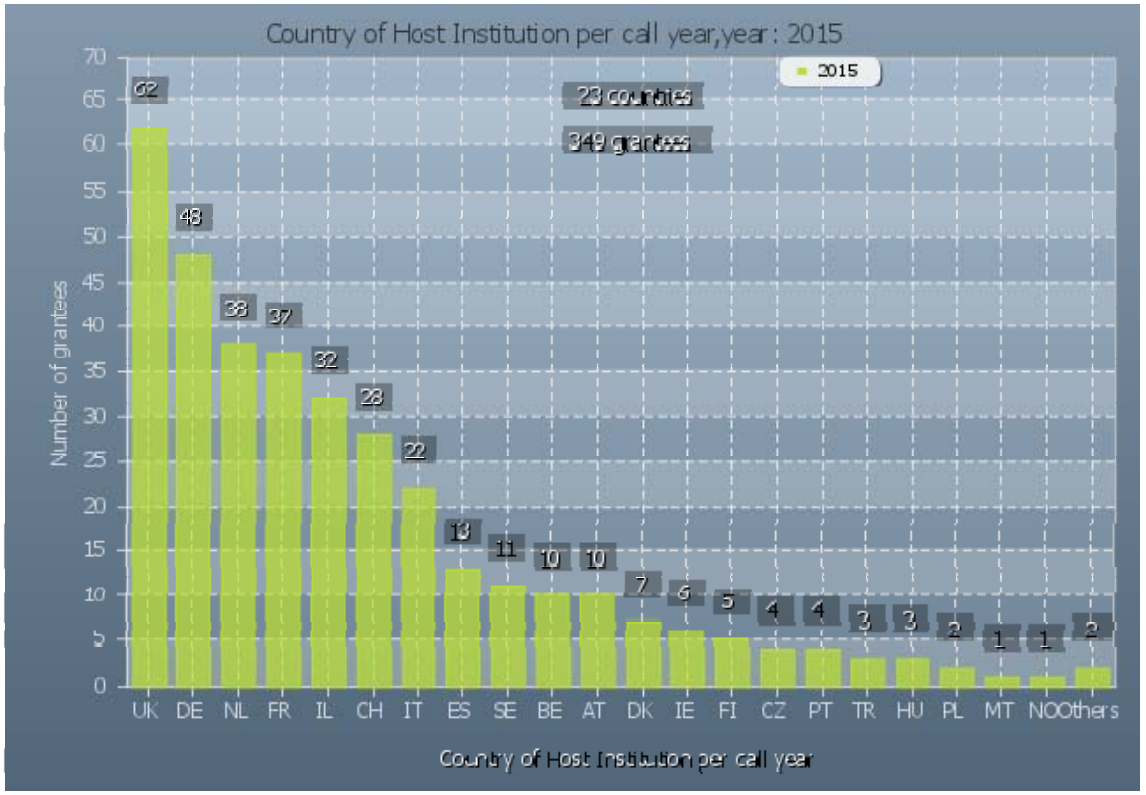
Scientific networking:

Scientific contacts can be of major importance in grant applications. It is a notable advantage if the scientific community, referees, funding agency officers know you and/or your work.

Talks, seminars, collaborations, organization of events,

Actions: travel frequently, build network of scientific contacts, big names help.

Example: some countries (institutions) are very successful in grant applications



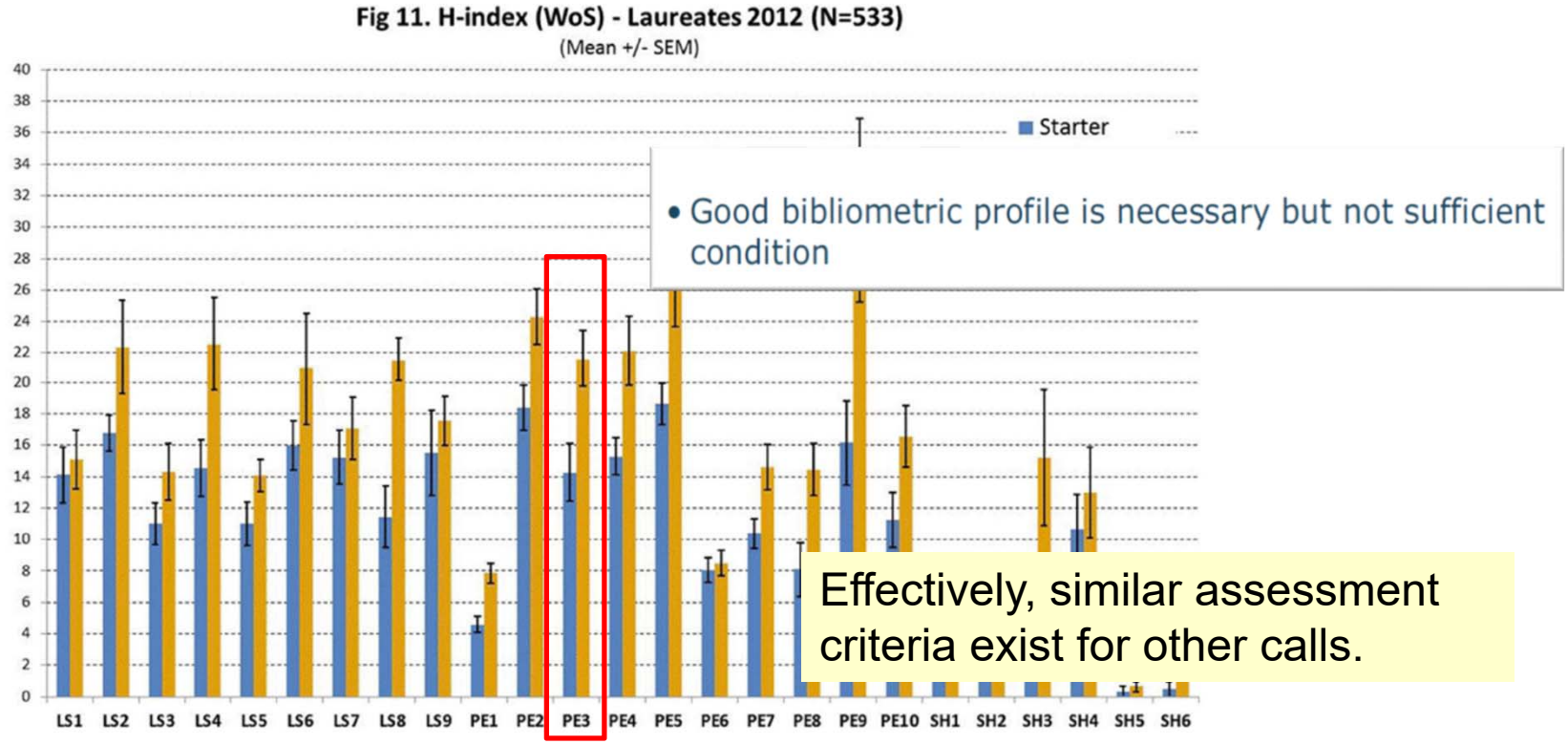
All awarded ERC grants in 2015 by country

https://erc.europa.eu/projects-and-results/statistics

Make realistic applications:

Decide for grant applications which are realistic and have chances for success.

Example: bibliometrics in ERC grants



O. Pecha, Results of a bibliometric analysis of successful applicants for ERC Starting grants in 2012;

http://www.h2020.cz/cs/storage/e8b76a3a580a78222805fd9085315ce3e464c48a?uid=e8b76a3a580a78222805fd9085315ce3e464c48a

Conclusions

- EU funding is of major importance as addition to national and other funding sources.
- Typically, success rates of the grant applications are low which requires constant and persistent effort in submitting applications.
- Success / failure with the grant application depends on many factors (not only science & idea)

As (young) group leader working in natural sciences (physics):

- Effectively, really accessible Horizon 2020 grant schemes with chances for success are ERC, Marie Curie, (and FET).
- Applications to ‘big’ grants require major effort, which (if/when unsuccessful) affects the performance of the group. Therefore, important to be realistic in applications.