

**Application for renewal of support:
COW and CALF Seminars in Algebraic Geometry, 2025**

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This is an application for funding to support the activities of the COW and CALF seminars (cow.alggeo.xyz) during the academic year 2024-2025. HIMR has previously provided funding for these seminars for the years 2022-2023 and 2023-2024.

Background and context. The COW seminar is an algebraic geometry seminar, so called because it originally met in Cambridge, Oxford and Warwick. It has remained active since its start in 1992, and has played a large role in creating and maintaining a vibrant algebraic geometry community in the UK. The COW and its junior seminar, the CALF (run by and for graduate students in algebraic geometry), meet multiple times a year in locations across the southern UK, with each meeting consisting of 3 talks. The meetings are also broadcast via Zoom.

The UK algebraic geometry community is especially cohesive and dynamic, and the COW seminar plays a crucial role in fostering this. The objectives of our meetings are:

- to give algebraic geometers in the south of the UK the opportunity to hear high-level talks in the subject;
- to provide speakers, particularly early-career researchers, post-doctoral students, and international visitors, with a larger audience of specialists than any single university can achieve;
- to create and develop contacts between algebraic geometers in a wide geographical area, in order to provide opportunities for discussion of developments in the topic, as well as the chance for research students to meet prominent geometers from outside their university;
- to promote diversity, by featuring speakers who can act as role models to graduate students, and by facilitating participation of people with caring responsibilities (through opportunities to deliver/attend talks remotely and by covering caring costs when needed);
- to foster a friendly and supportive algebraic geometry community, through social interactions (lunches, dinners, coffees, group travel) which take place before and after the seminar.

The activities of the COW seminar are especially important for researchers from smaller universities, who might be the only algebraic geometer at their institution and thus have limited opportunities to attend specialist talks. Some of the meetings are held in universities in which algebraic geometry talks may otherwise be rare, and COW has a wide network of local organisers.

COW meetings are a way to make research students, post-doctoral researchers, early-career researchers, and new arrivals to the UK feel part of a friendly, welcoming and active community, to which they can turn to for scientific and career advice, encouraging the retention of new talent within UK algebraic geometry.

The COW actively promotes diversity and participation of women as speakers. In the 2023-2024 academic year, 9 out of 35 total speakers were women. In the current 2024-2025 academic year the ratio has improved further, with one third of all speakers thus far being women.

Another part of the COW network is its mailing list, which is hosted at Warwick and now has around 1,000 subscribers from at least 45 different countries, more than 200 of whom are women. It carries the announcements of the COW seminars as well as job offers, conference announcements, and PhD places in the UK and elsewhere.

In 2022, after noticing that many PhD students based in Scotland and the north of England were attending COW seminars, the COW organisers and colleagues based in Scotland submitted an application to the Isaac Newton Institute for a UK Algebraic Geometry Network aimed at strengthening UK-wide exchanges in Algebraic Geometry. Our application was successful and the UK Algebraic Geometry Network is funded for the period 2023-2025. The activities of the network are complementary to the COW and CALF seminars (with some overlap in organisers), and each year we hold a 2-day meeting and school aimed at PhD students in the UK.

Planned activities. The COW seminar hosts around 8 meetings a year, each with 3 speakers. We deliberately do not plan the meetings too far in advance in order to be able to respond to events such as new mathematical developments and visits to the UK by overseas algebraic geometers. By holding meetings in different institutions, we ensure that most algebraic geometers based in the south of the UK can reach at least some of the meetings easily.

Thus far we have organised 3 COW meetings this academic year: in Oxford on 25th October 2024 (39 attendees), in Bath on 14th November 2024 (22 attendees), and in Warwick on 20th February 2025 (upcoming).

In addition, the COW budget supports the activities of the CALF seminar, run by and for PhD students. CALF meetings feature talks by PhD students in algebraic geometry and are organised on a semi-regular basis at their initiative. Thus far there have been 2 CALF meetings this year: in Cambridge on 17th January 2025 (22 attendees) and in Warwick on 29th November 2024 (14 attendees).

We believe that it is vital for us to sponsor PhD students' travel to attend and speak at both COW and CALF meetings, as relatively little funding is available to do so otherwise, and these are valuable professional development opportunities.

Budget, secured funding and required funding. The COW funding is spent exclusively on the travel of speakers and UK-based PhD students and postdocs. In exceptional cases, when evening return trains are impracticable, we fund overnight accommodation for speakers. We do not fund international travel for speakers, instead using our flexibility to invite international speakers when they happen to be visiting the UK.

When we first applied for funding from HIMR in September 2022, we were hoping to strengthen the funding model for the COW seminar, which had had to stop running early the previous academic year due to lack of funding. Traditionally the COW had been funded by an LMS Scheme 3 grant, the value of which has decreased in the recent years (the Scheme now allocates at most £1,500 per year).

In the meantime, our meetings have never been so well attended, and with the added effect of rail fare increases, the average cost to host each COW/CALF meeting is around £350.

Thanks to the funding received from the HIMR for the academic years 2022-23 and 2023-2024, we have run a rich programme of activities (see the appendix for a full report). Notably, we have been able to cover travel expenses for all PhD students in need of funding to attend meetings. This has had an extremely positive impact and guarantees that the UK algebraic geometry community remains active, vibrant, and at the forefront of the latest developments in the field.

Lastly, the seminar is supported by its members' grants, and by individual departments (these contributions are difficult to estimate, however, each meeting of around 20 people, many of them travelling, would cost around £800 per meeting if all speakers were UK-based, possibly more if some come from abroad).

Ideally, we would like the overall COW budget to be about £4,000 per year. At an average cost of £350 per meeting, this would allow us to run approximately 11 meetings of the COW and CALF seminars per year, in line with previous years (see the appendix for the 2023-2024 academic year).

We will continue applying annually to the LMS' Scheme 3; this year, they have awarded us £1,500. Hence we apply for a renewal of the funding we received from the HIMR in September 2023, and apply for a Small Grant of £2,500.

Appendix: activities during the academic year 2023-2024

1. COW Seminar at University of Cambridge, 02/11/2023
 Jesus Martinez Garcia (Essex) spoke on computational geometric invariant theory, Nicholas Shepherd-Barron (King's College London) spoke on Schiffer's theme, and Luca Giovenzana (Early Career, Sheffield) spoke on Type II degenerations of K3 surfaces.
 Number of participants: 27 (4 female, 23 male) + 8 online.
2. CALF Seminar at University of Cambridge, 22/11/2023
 Shivang Jindal (Edinburgh) spoke on quantum groups and Donaldson–Thomas theory, Joseph Malbon (Edinburgh) spoke on explicit K-Stability for Fano threefolds, and Siao Chi Mok (Cambridge) spoke on logarithmic Fulton-MacPherson configuration spaces. This being a CALF (junior COW) event, all three speakers were PhD students.
 Number of participants: 20 (6 female, 14 male).
3. COW Seminar at Queen Mary University of London, 01/12/2023
 Nivedita Viswanathan (Early Career, Brunel) spoke on Higher Fano manifolds, Timothy Logvinenko (Cardiff) spoke on Skein-triangulated representations of generalised braids, and Christian Böhning (Warwick) spoke on equivariant birational types.
 Number of participants: 30 (9 female, 21 male).
4. COW Seminar at University of Nottingham, 25/01/2024
 Travis Schedler (Imperial College London) spoke on crepant resolutions of stratified varieties, Fatemeh Rezaee (Early Career, Cambridge) spoke on smoothings of stable maps, and Jenia Tevelev (University of Massachusetts Amherst) spoke on semi-orthogonal decompositions of moduli spaces. This event took advantage of Professor Tevelev's visit to the UK.
 Number of participants: 21 (3 female, 18 male).
5. COW Seminar at University of Essex, 15/02/2024
 Victoria Hoskins (Radboud Universiteit Nijmegen) spoke on motivic mirror symmetry for Higgs bundles, Balazs Szendroi (Vienna) spoke on the projective coinvariant algebra, and Tim Magee (Early Career, King's College London) spoke on broke line convex geometry. This event took advantage of both Professor Hoskins and Professor Szendroi being in the UK.
 Number of participants: 19 (4 female, 15 male).
6. CALF Seminar at University of Birmingham, 22/02/2024
 Antoine Pinardin (Edinburgh) spoke on G-solid rational surfaces, Girtrude Hamm (Nottingham) spoke on combinatorial automorphisms of spherical varieties, and Alberto Cobos-Rabano (Sheffield) spoke on curve counting on toric varieties. This being a CALF (junior COW) event, all three speakers were PhD students.
 Number of participants: 20 (6 female, 14 male).
7. COW Seminar at University of Bath, 14/03/2024
 Itay Glazer (Oxford) spoke on word maps and applications to random walks, Gergely Berczi (Aarhus) spoke on the geometry of the Hilbert scheme of points, and Dominic Bunnett (TU Berlin) spoke on the geometry of moduli spaces of hypersurfaces.
 Number of participants: 16 (3 female, 13 male) + 2 online.

8. COW Seminar at University of Liverpool, 02/05/2024

Rob Silversmith (Early Career, Warwick) spoke on r-spin theory and tropical geometry, Navid Nabijou (Queen Mary) spoke on logarithms and roots in enumerative geometry, and Barbara Fantechi (SISSA): spoke on moduli of zero dimensional coherent sheaves. This event took advantage of Professor Fantechi's visit to the UK.

Number of participants: 17 (3 female, 10 male, 1 agender, 2 non-binary, 1 prefer not to say).

9. CALF Seminar at University of Bath, 16/05/2024

Yannik Schuler (Sheffield) spoke on tangents to nodal cubics, Rhiannon Savage (Oxford) spoke on representability for stacks in derived geometry, and Oliver Daisey (Durham) spoke on a Laurent phenomenon for the Cayley plane. This being a CALF (junior COW) event, all three speakers were PhD students.

Number of participants: data pending.

10. COW Seminar at Cardiff University, 27/06/2024

Ed Segal (UCL) spoke on the McKay correspondence via VGIT, Evgeny Shinder (Sheffield) spoke on Gromov's cancellation question in birational algebraic geometry, and Erroxe Etxabarri Alberdi (Early Career, Warwick) spoke on 1-dimensional components of the K-moduli of Fano 3-folds.

Number of participants: 14 (3 female, 11 male).

11. COW Seminar at Queen Mary University of London, 29/08/2024

David Favero (Minnesota) spoke on homotopy path algebras and resolutions, Nicholas Proudfoot (Oregon) spoke on the algebraic geometry of Kazhdan-Lusztig-Stanley polynomials, and Marta Benozzo (Early Career, UCL/LSGNT) spoke on the anti-Iitaka conjecture in positive characteristic. This event took advantage of Professor Proudfoot's visit to the UK.

Number of participants: 16 (2 female, 12 male, 1 agender, 1 prefer not to say).

The COW also contributed to the organisation of the UK Algebraic Geometry Network meeting in Durham on 11th-12th September 2024. This annual meeting of the UK Algebraic Geometry Network consisted of 6 talks spread over 2 days.