

The Research Ecosystem

Careers, Statuses, and the Machinery Behind the Lectern

What it takes to become and remain a researcher in Europe — and the people, workshops, and shared infrastructures a working laboratory actually depends on, from the design office down the corridor to the synchrotron on the other side of the continent.

Behind the two people a student actually sees

Every student meets two figures directly: the lecturer at the front of the room, and the pedagogical secretariat that manages enrolment. Both are the visible tip of a much larger structure. This chapter maps that structure in two stages — first the sequence of statuses a research career passes through, and how differently it is organised from one European country to the next; then the wider ecosystem of people, workshops, and shared facilities a working laboratory actually depends on.

1

Doctoral training

Three years in France, no single model in Germany, a taught-master's-like five to six years in the US — the shared label “PhD” hides real structural variation.

2

The postdoc interval

Marie Skłodowska-Curie fellowships, national schemes, and a structurally precarious sequence of short contracts before — if at all — a permanent post.

3

Permanent positions

Fonctionnaire status in France, the American tenure clock, Germany's Habilitation — three different ways of allocating early-career risk.

4

The wider ecosystem

Administrative and technical staff, design offices and workshops, and shared national and international infrastructures such as the synchrotron.

Illustrative national portraits throughout — not an exhaustive country-by-country survey.

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Becoming a Researcher: Doctoral Training around Europe

The shared label “PhD” hides real differences in duration, funding, and supervision.

France and Germany: two very different models

FR

France expects a thesis to take three years, funded most often by a contrat doctoral (a fixed-term employment contract) or, for industry partnerships, a CIFRE convention. Supervision is nominally by a single directeur de thèse, though co-supervision is routine; since a 2016 reform, an individual monitoring committee follows each candidate independently of the supervisor.

DE

Germany has no single doctoral model at all: an informally arranged Doktorand attached to a professor's chair, with no fixed duration and no guaranteed contract, sits alongside structured graduate schools — often modelled on the Max Planck Society's International Max Planck Research Schools — that impose a defined curriculum and a three- to four-year target duration.

Historiographical note

Germany's fragmented model is itself a legacy of the Lehrstuhl tradition, in which the professor's chair has historically held wide discretion over how research training under it is organised.

The United Kingdom and the United States



The United Kingdom funds most science doctorates through UK Research and Innovation (UKRI) studentships awarded to doctoral training partnerships or centres — typically three to four years, with a supervisory team of a first and second supervisor rather than a single director, and an annual progress review built into the funding requirement.



The United States runs a noticeably longer timeline: five to six years is typical, because the first one to two years are spent on coursework and qualifying examinations before full-time dissertation research — closer to a taught master's folded into the doctorate. Funding is usually a research or teaching assistantship tied to a specific grant, linking a student's security directly to their advisor's own funding success.

Historiographical note

These four sketches are illustrative, not a survey. EU-funded structured programmes, such as the Marie Skłodowska-Curie Doctoral Networks discussed next, increasingly cut across all four patterns by requiring international mobility — narrowing, without eliminating, the national differences sketched here.

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The Postdoctoral Stage: Fellowships and Precarity

Almost everywhere in Europe, a doctorate is followed by one or more fixed-term posts before — if at all — a permanent one.

The defining European postdoctoral instrument

The MSCA Postdoctoral Fellowship, part of the EU's Horizon Europe programme, is a competitive, individually held grant that funds a researcher — of any nationality — to spend one to two years at a host institution in an EU member state or associated country, on a project the fellow largely designs themselves with a host supervisor.

- 1 Global Fellowship variant** an initial period outside Europe, followed by a mandatory return phase at a European host — designed to bring internationally trained researchers back rather than losing them permanently.
- 2 National schemes, and grant-funded postdocs** national agencies run parallel postdoctoral schemes of their own, and many postdoctoral positions are simply line items within a supervisor's own project grant, with no dedicated fellowship at all.

Short contracts, at exactly the wrong moment

Historiographical note

The postdoctoral interval is increasingly discussed in the research-policy literature as structurally precarious: a sequence of short fixed-term contracts, often requiring relocation between them — sometimes across countries — during precisely the years in which many researchers are also making major personal decisions about long-term residence and family.

This is not a peripheral complaint. French and European Union bodies have both, in different contexts, formally acknowledged rising average postdoctoral duration and the retention and well-being costs associated with it. This course flags the pattern rather than treating it as background noise, because it materially shapes who can sustain a research career through to a permanent position and who cannot.

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Permanent Positions: A Few National Portraits

Three different ways of allocating career risk — not a ranking of the systems against one another.

Two parallel tracks, permanence on appointment

- 1 **University track** maître de conférences (half teaching, half research), reached via a national qualification (the CNU) then a competitive concours at an individual university. Promotion to professeur des universités requires first the habilitation à diriger des recherches (HDR), then a fresh competitive recruitment — no automatic internal promotion.
- 2 **Research-only track** through CNRS and the other national research organisations: chargé de recherche, then, after a further national competition, directeur de recherche — permanent research positions with no formal teaching duty at all.

In both tracks, appointment itself confers civil-servant (fonctionnaire) status essentially immediately — not after a multi-year probation.

Tenure clock, versus a qualification gate

US

Tenure-track an Assistant Professor holds a position that is, by design, not yet permanent, evaluated five to seven years in — drawing on external letters — for promotion to a tenured Associate Professor. Failure typically ends the appointment altogether (“up or out”), concentrating risk into one multi-year window.

DE

Habilitation historically tied a full professorship (a W3 chair) to the Habilitation, which could itself take five to fifteen years beyond the doctorate. Since a 2002 reform, a Juniorprofessur (W1) route allows independence without it first — deliberately shortening a path that left researchers dependent on one senior professor's goodwill for a decade or more.

Concentrated, distributed, or gated

Historiographical note

These three portraits illustrate three different ways of allocating career risk — concentrated in a single tenure decision (United States), distributed across a recruitment competition with immediate permanence on success (France), or gated by a lengthy separate qualification before the decisive competition is even entered (Germany's traditional Habilitation route) — rather than ranking the systems against one another.

Several other European countries, including Switzerland and the Netherlands, have adopted tenure-track models closer to the American pattern in recent decades: one respect in which these historically sharp differences are narrowing, without having disappeared.

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Beyond the Lectern: The Laboratory Ecosystem

The lecturer and the secretariat are the visible tip of a much larger structure.

Three kinds of roles that rarely appear in front of a lecture hall

Administrative & financial staff

manage grant contracts once awarded, track spending against budget lines, handle procurement, and process the paperwork — travel authorisation, expense claims, visa support — behind every conference trip or beamtime experiment.

Engineers & technicians

a design office (bureau d'études) turns an experimental requirement into detailed drawings; a workshop (atelier) machines, assembles, and repairs the resulting parts. Larger labs add cryogenics, vacuum, safety, and IT specialists.

Research-adjacent roles

librarians and data stewards managing publications and datasets; communication officers; and technology-transfer officers — in France, often at a dedicated SATT — who help a lab patent, licence, or spin out results.

A ratio worth stating plainly

Historiographical note

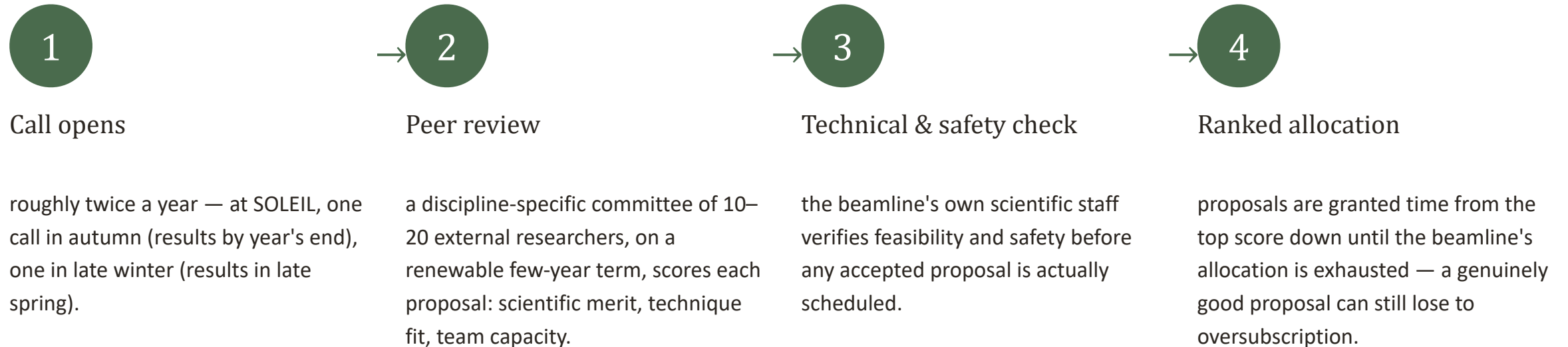
None of this is unique to any one country or discipline, but the ratio of visible to invisible roles is easy to lose sight of as a student: a functioning experimental laboratory typically employs several support staff — administrative, technical, or both — for every researcher whose name appears on the resulting papers. The laboratory's actual scientific output depends on all of these roles working together, not on the researchers alone.

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Large-Scale Research Infrastructures: the Synchrotron

Not all research happens inside a single laboratory's own walls.

The SOLEIL / ESRF access model, step by step



Beyond a single cycle

Research groups with a long-term, recurring need can instead apply for a multi-year Block Allocation Group (BAG) award, which grants a fixed annual time budget the group itself then distributes among its own experiments, subject to periodic renewal rather than a fresh competitive proposal every cycle.

A pattern, not a synchrotron-specific quirk

Historiographical note

The same basic logic — a periodic call, external peer review by a standing committee, competitive ranking against a hard capacity limit — governs access to most other large-scale research infrastructures: neutron sources such as the Institut Laue–Langevin in Grenoble, free-electron lasers such as the European XFEL near Hamburg, high-field magnet facilities such as the LNCMI in France, and national or European supercomputing allocations (GENCI in France, the EuroHPC Joint Undertaking at European level).

The details of call frequency, scoring criteria, and committee structure differ from one facility to the next; the synchrotron example is meant to make the general shape of that access model concrete, not to suggest every facility runs on an identical calendar.

From who does research, to how research works

This chapter described the people and structures research depends on: the sequence of career statuses a researcher typically passes through, which differs sharply from one European country to the next even as EU-level programmes gradually narrow those differences; and the wider ecosystem — human and institutional — that a working laboratory needs in order to function at all.

Next: the practical machinery.

Chapter 8 turns from who does research and where, to how research is actually funded, judged honest, evaluated once published, and shared — the machinery the careers and institutions described here actually run on day to day.

FURTHER READING

- European Commission, Marie Skłodowska-Curie Actions: Guide for Applicants — Postdoctoral Fellowships (Horizon Europe, updated annually)
- European Synchrotron Radiation Facility, Users and Science: Proposal Submission Guidelines, [esrf.fr](https://www.esrf.fr)
- Mary Frank Fox and Catherine Mavriplis, eds., Handbook of Academic Careers in Science and Engineering
- DFG and HRK, joint guidance on the Habilitation and Juniorprofessur reforms (2002 federal framework law and amendments)
- Synchrotron SOLEIL, User Guide and Call for Proposals, [synchrotron-soleil.fr](https://www.synchrotron-soleil.fr)

Chapter 7

Questions?

From a three-year contrat doctoral in France to a synchrotron beamtime committee in Grenoble: research is a career pipeline and a shared physical infrastructure before it is ever a result on a page.