Laboratory for Foundations of Computer Science

Research Committee Meeting

11am-12.30pm Wednesday 16 June 1999
Room 6206, JCMB, King's Buildings

Agenda

1. Apologies for absence.
2. Minutes of last meeting [p 2] .
3. Director's report.
4. Deputy Director's report [p 4] .
5. Service Manager's report.
6. Results of the Theory Postgraduate Course (Martin Escardo).
7. Divisional software support (Ian Stark).
8. Interactions with the rest of Informatics.
9. Any other business.

For information, here is the application [p 13] for LFCS to become an Institute in the Division of Informatics.

Collected papers for this meeting.

The next meeting of the research committee will be in week 5 or 6 of next term. A choice of possible times will be circulated in advance.

Ian Stark
Tuesday 15 June 1999

Laboratory for Foundations of Computer Science

Research Committee

Minutes of the meeting held on 1 July 1998

In the absence of official minutes from Gordon Duckett, the following have been provided by Don Sannella.

---

1. Matters arising from minutes

Martin Escardo to convene first year PhD students progress meeting. [mhe, continued]

Another attempt will be made to conduct theme reviews, concentrating on complexity first. [grd, continued]

Allocation of new machines. [grd+dts, happened]

MLWorks site licence. [soa, continued]

Grant information (current grants and how to apply for grants) on LFCS web pages. [grd+mkl, continued]

Pursue idea of CD Rom containing LFCS reports. [grd, continued]

LFCS brochure. [grd, continued]

Lucas Aerospace link. [grd, continued]

4. LFCS and the Division of Informations

What is the difference between LFCS as it is now and institutes? The main difference is that institutes can have responsibilities placed on them by the division.

The current plan is to delay forming institutes until various discussions have taken place. It was decided that we should say that we want to be an institute right now, rather than waiting for the outcome of these discussions. [action dts]

Laboratory for Foundations of *Informatics* or *Computation* or *Computer Science*? We decided on the latter -- maybe we will broaden in due course but it we should wait to see if this happens.

Interactions with the rest of Informatics (links and opportunities) should be a permanent item on the research committee agenda. [action grd]

LFCS should organize meetings to interact with others in Informatics. Such as:

- computational linguistics
- reasoning
- software engineering
- agents

Theme reviews could have external participants. [action grd]

There was discussion of the wording of the aims of LFCS, and various changes were suggested. [action dts -- see the application to become an Institute [p 13] for what happened]

In future, we need to address the softening of boundaries (this will be solved almost without specific action) and LFCS's inertia. [action dts, grd]

Ian Stark
Tuesday 15 June 1999

Laboratory for Foundations of Computer Science

Research Committee Meeting
Deputy Director's report

Ian Stark
Tuesday 15 June 1999

EPSRC

In March Mark Wilkins, IT&CS programme manager, invited comments on a draft revision of the programme structure. I sent an LFCS response to this [p 6] , gathering contributions from various members of the Laboratory.

In April I participated in a meeting on *Long-term Research Goals for IT&CS* . In June Monika Lekuse and I attended the EPSRC regional seminar in Edinburgh; here is my report [p 10] on this.

Equipment

In April LFCS purchased five new Linux desktop machines. These have been distributed, and following some rearrangement we are now able to provide each LFCS Phd student with their own machine. It is the stated aim of the Division to achieve this level of support anyway; we expect to maintain it with our own resources until Divisional provision becomes a reality.

LFCS has also bought a new Sun file server, mor. This will serve home directories, and should keep up with the load placed by these faster desktop machines.

Milner lecture

This year's Milner lecture was given by Butler Lampson on *Computer Security in the Real World*. A videotape of the talk is available.

Please send any suggestions for next year's speaker to me; here you can find the aims of the Milner lecture series [p 12] .

PhD studentships

The last Directors meeting put aside money for an LFCS studentship. All applicants for PhD places in the Laboratory were automatically considered for partial or total support under this.

This year the studentship has been awarded as follows.

- **Martin Lange** (supervisor Colin Stirling). Three years of full maintenance and fees.
- **Massimo Felici** (supervisor Stuart Anderson). One year of fees only.

These provide a balance of one-off and recurring commitment by LFCS. Depending on finances, it should be possible to make a further studentship award next year.

LFCS won the following support from the Divisional studentship.

- **Jan Jurjens** (supervisor Samson Abramsky). Three years of fees only. Jan has a scholarship from the *Studienstiftung des deutschen Volkes* to pay his maintenance.

The Division has been assigned six EPSRC quota awards. LFCS holds one so far.

- **Stephen Thomas** (supervisor Gordon Plotkin).

Gordon Plotkin has a further studentship with an EPSRC grant: this is still to be assigned.

Research travel

The departmental budget for research travel died with the department. Responsibility for this now falls on individual institutes, and LFCS money is available to fund attendance at conferences and workshops. Anyone interested should talk to me in the first instance.

Guidelines are essentially as before: while no-one should be prevented from presenting their work at a meeting dues to lack of funds, we are all expected to apply for grant and other funding in preference to general institute money. PhD students in particular can request some support from the graduate school for up to one trip per year.

Laboratory for Foundations of Computer Science 26 April 1999
Division of Informatics, University of Edinburgh

Response to the draft document

IT&CS Programme, Version 3

This response comprises some general comments on the underlying programme structure, and two detailed recommendations on programme content. The first concerns the "techniques" theme, and the second addresses the overall choice of themes.

Before that though, LFCS would like to say how much we value the service provided by the programme management under the present scheme. Much of our contact is with Dominic Semple, and he has been excellent: conscientious and responsive to all our requests.

Comment

A basic problem with the proposed framework is that it categorizes theoretical computer science in an inappropriate and potentially misleading fashion. It is not a "technique" or collection of techniques, but rather the foundational and mathematical mode of studying topics ranging throughout the IT&CS programme.

Ideally, one would like to see the framework laid out as a 2-dimensional structure, with methodologies and modes of study, embodying key clusters of expertise, in one dimension, and specific topics and application areas in the other. For example, theoretical work can and certainly does impinge on machine learning, critical systems, mobile systems, and cognitive science, to choose just one "slice" through the other columns.

While we recognize that such two-dimensional structures are not so easy to tabulate, or to reflect in the organisational structure of the programme, we nevertheless believe that it is very important that these cross-connections should be explicitly acknowledged as the new structure is put into place. Moreover, the key role of the foundational mode of study throughout the IT&CS programme should be recognized by substantially revising the Techniques theme. Our first recommendation gives a detailed proposal for how this might be done.

Recommendation 1

We note that several topics from theoretical computer science cluster to form the "techniques" column. Extracting from the current IT&CS business plan:

> Theoretical computer science, undoubtedly world-class in the UK, provides the formal underpinning of software engineering and the design and integration of software-based systems, an activity of immense commercial and industrial importance.

The recent programme evaluation also highlights theoretical computer science as a rich source of quality long-term research, which is exactly what council wishes to focus on at present.

In the light of this, we propose that this theme be titled

Foundations of Computation

to include the following topics.

Models of computation	Encryption
Complexity	Security
Concurrency	Programming languages
Logic	Analysis of algorithms
Specification	Adaptive algorithms
Verification	

The two topics remaining in the draft theme - Electrical/Optical Design and Digital Signal Processing - now sit rather poorly with this theme. We suggest however that they may find a more fitting home in the fuller reorganisation of recommendation 2 below.

Looking outside the central area of LFCS interest, our second recommendation recasts the choice of themes and their relationship to each other along the value chain.

Recommendation 2

The products and services based on the science base generated by research in IT and CS are becoming more and more economically significant. Early in the 21st century they may become the dominant sector in global economic activity. IT products are distinctive from conventional products in the extent to which they become embedded in the cognitive, social and organisational practices and incorporate aspects of these practices into their design and construction.

The revised programme below take this characterisation as its stating point and attempts to delineate programme areas that will ensure the development of long-term high quality basic research, along with research that contributes to an understanding of how fundamental work can contribute to the development of new product areas and new IT services.

We believe that this structure, without claiming the complacency of a single all-embracing vision, provides a fertile ground for future interaction and progress in the discipline.

- Foundations of Computation, Physical Devices and Information and Communication are the three areas of fundamental work that contribute to a deeper understanding of the mathematical, logical, physical and and human aspects of computational systems. Each makes a distinctive contribution to the understanding of the basis of computation.

- Infrastructure groups work on developing understanding and techniques for bringing computational analyses and solutions to bear on particular design problems and assessing properties and attributes of computational components.

- Technologies groups work on mature and emerging technologies, sponsoring work on extending the scope of technologies that cannot be expected to arise via normal industrial R and D.

- Process groups work on IT system production process. IT systems are distinctively different from conventional engineered systems (complexity, absence of production engineering, extensive on-site reconfiguration, ...) and there remain many difficult research problems in understanding how to create a reproducible IT system production process.

- Embedding... takes the whole issue of IT systems embed and how they incorporate cognitive, social and organisational problems in their structure. This includes the application of relevant research to other academic disciplines. Developing a better understanding of these issues is essential to success in exploiting the extensive IT and CS science base.

Proposal for a revised IT & CS Programme

Foundations of Computation	Models of Computation, Complexity, Analysis of Algorithms, Logic, Security, etc.
Physical Devices	Neural, Silicon, Photonics, etc.
Information and Communication	Distributed Computation, Mobility, Human Communication, Neural Computation, Knowledge Representation, Perception and Action
Infrastructure	(H/W and S/W) Architecture, Languages, Modelling, Specification, Design, Test, Verification
Technologies	Speech, Vision, VR, Expert Systems, Machine Reasoning, Multimedia, Graphics, Visualisation, Security, User Interfaces, Workflow, Networking and Protocols
Process	Requirements Engineering, Empirical Studies of Process, Reengineering, Process Design, Quality, Reliability, Dependability, Safety, etc.
Embedding and Application of IT and CS	Systems Integration (Healthcare, Business Process etc.), Social Studies of IT (Diffusion, Innovation, Social Shaping, etc.), Cognitive Studies, Bioinformatics

This response was prepared by Ian Stark (Deputy Director, LFCS) with contributions from the following.

Professor Don Sannella (Director, LFCS)
Professor Gordon Plotkin

Professor Samson Abramsky
Stuart Anderson
Monika Lekuse

This week EPSRC held a seminar in Edinburgh, presented by Professor Richard Brook (Chief Executive) and David Clark (Engineering and Science Director). Monika Lekuse and I attended; the following is a report of some points relevant to the Division.

Ian Stark

==

EPSRC Academic Regional Seminar - Edinburgh - 8 June 1999

Contract researchers. There are plans to introduce courses for postdoctoral researchers similar to the existing CRAC courses for PhD students. Current figures suggest that at most 20% of EPSRC contract researchers may eventually get long-term academic posts.

Electronic document submission. A revised system for putting in research applications electronically will start in September. See the web at http://www.epsrc.ac.uk/eds . A notable point for us is that Unix will now be supported.

Masters courses. There was much heat but little light raised on the nature of future EPSRC support for MSc courses.

Research Grants

- Funding for the IT&CS programme in 99/00 is to go up by 7.5% in real terms. No programme had a real term reduction.

- The success rate for EPSRC research grant applications is running at 40%, slightly lower for IT&CS. This was compared with 15% for EU applications.

- The Fast Stream scheme has attracted a large number of applications, with a success rate of 60%. This is thought to be a Good Thing.

- Since the end of last year, proposers have had the opportunity to comment on referee reports before these go to the review panel. This has been well received by both proposers and reviewers.

- Turnaround times for proposals now average 15 weeks. The fact that they now have suitable data to measure this is apparently as significant as the number itself.

- EPSRC is actively attempting to change the composition of review panels, to reduce the average age and include more (indeed, some) women.

Joint Infrastructure Fund

In the first round EPSRC received £310M in JIF proposals, of which £56M received funding. Numerically, out of 89 proposals 22 were rated by EPSRC as alpha-plus, meaning: if this is not funded then JIF has failed in its aims. Of these 22 just 11 were successful. The other 11 will be resubmitted by EPSRC in later rounds.

By way of comment, Richard Brook said that at around 20% the success rate was well below general EPSRC levels; that this was expected to become lower in future rounds; and that the effort involved in proposals was exceptionally high. While noting that he could not officially tell people that it was not worth the effort applying, he did everything short of this.

He also mentioned some difficulties with the JIF process. For example:

- There is no preliminary round for draft proposals. EPSRC requested one, but Wellcome refused it.

- The operation of the fabulously-named "interdigitation committee" may work to the disadvantage of EPSRC.

A final amusement: for the second JIF round, EPSRC have already had one application for a £66M grant. This is £10M more than the amount it won in the first round.

===

Before he left Edinburgh for Cambridge, Robin Milner very kindly donated a sum of money to fund an annual lecture in Computer Science at the University of Edinburgh, given "by someone from outside the University who has done or is doing excellent and original theoretical work which has a perceived significance for practical computing. The spirit of the proposal is to keep a live connection between theory and application in computer science."

The selection is made by the LFCS Directorate on the basis of a periodic call for nominations. The Milner Lecture ordinarily takes place in Summer term. The speaker visits for several days and usually gives one or more informal talks in addition to the Milner Lecture.

==

Milner lecturers to date

1996 Gerard Berry, Ecole des Mines and INRIA, Sophia-Antipolis
Synchronous Programming of Reactive Systems

1997 Les Valiant, Harvard University
Cognitive Computation

1998 Amir Pnueli, Weizmann Institute
Temporal Logic for Verification of Reactive Systems

1999 Butler Lampson, Microsoft Research
Computer Security in the Real World

Application for LFCS to become an Institute in the Division of Informatics

Introduction

The Laboratory for Foundations of Computer Science (LFCS) was formed in 1986 on the basis of a strong existing group in Theoretical Computer Science. It quickly built up a strong reputation and is now generally accepted as one of the leading centres in the world in Theoretical Computer Science and its application. Its present organization and structure is essentially that proposed for Institutes in the Division of Informatics.

LFCS wishes to continue in more or less its present form as an Institute within the Division of Informatics. It wishes to become an Institute now rather than waiting for the picture across all of Informatics to become clear.

An overview of the present organization of LFCS is available at http://www.dcs.ed.ac.uk/home/dts/lfcs.html. Much of what follows appears there in some form. The LFCS home page is at http://www.dcs.ed.ac.uk/lfcsinfo/. The information there on research topics and grants is seriously out of date, but the remaining information (overview, teaching, publications, software, events) is fairly accurate.

Scope and rationale

The mission of LFCS is to achieve a foundational understanding of problems and issues arising in computation and communication through the development of appropriate and applicable formal models and mathematical theories. In more detail:

> The *main purpose* of LFCS is to develop theories that address issues arising in computing, principally those which are likely to be a basis for methodologies or understanding; the criteria for this research will be lucidity, coherence and applicability. An important component of such a theory is typically a formalism (e.g. a logical calculus) which embodies it; applicability may be demonstrated via a tool employing the formalism. There are two important *supporting purposes*:
>
> - Interaction between industry and universities through application studies and experiments. The aim here is twofold: such interaction provides important feedback in evaluating theories; it also provides ''real-world'' understanding of which areas are currently in most need of the development of relevant theories.
> - Enlargement, in the industrial and academic communities, of knowledge essential for grasping and applying soundly-based methodologies. This will be approached both through undergraduate and postgraduate courses and more widely through courses for the academic and industrial community.

Achieving a deep understanding of the nature of computation and computing systems is regarded as a worthy intellectual goal with strong potential for engineering application. Robin Milner's inaugural lecture for LFCS (see http://www.dcs.ed.ac.uk/lfcsreps/86/ECS-LFCS-86-1) spells out the rationale behind the main purpose of LFCS more eloquently than this application possibly can. The main idea, and the reason for the use of the word ''Laboratory'' -- which we wish to retain, concerns the mutually beneficial interplay between theory and practice via experimental application of the theory in building systems.

LFCS has an impressive track record of seminal research in this area. Its work has strongly influenced the development of Computation Theory particularly in the fields of semantics, specification, concurrency, complexity, machine assisted proof and implementations, both of languages and of proof systems.

There is a broad consensus within LFCS concerning the kind of problems that are interesting and important, about approaches to solving problems, and about standards of research. The approach to solving problems is generally mathematical, often employing methods originating from or inspired by mathematical logic, but also making whatever use of other mathematical tools -- algebraic, categorical, lattice-theoretic, combinatorial, analytic, etc. -- as appropriate. Another major unifying factor is the employment of a common programming language with advanced typing facilities, currently Standard ML. This shared culture is a very important part of the strength of LFCS.

Research in this area is beginning to make an impact on industry. Some examples are: use of formal methods in development of safety-critical systems; use of model-checking for hardware verification; relevance to the System Level Integration initiative. Much of LFCS's work could be characterized as basic research on theoretical foundations but there is a significant amount of applied research and much of this applied work has connections with groups in industry. Members of LFCS undertake consultancy work and LFCS receives some direct industrial funding; however, the main purpose of such contacts for us is as a source of interesting research problems and realistic case studies rather than as a source of income.

In their report, the IPU reviewers suggested that LFCS should split into separate institutes of Reasoning and of Computing Foundations. This suggestion was discussed extensively within LFCS but was rejected on the grounds that LFCS is intellectually coherent as it stands and that the suggested split would break many vital links between work on reasoning and the rest.

LFCS does not wish to broaden its scope to ''Foundations of Informatics'', although its expertise is clearly relevant to some topics outside Computer Science. There is great enthusiasm for collaboration with others in the Division and such a broadening might take place naturally over time, but it seems pretentious and currently insufficiently justified to assume this in advance. LFCS will be pro-active in seeking appropriate partners within the Division for collaboration. For example, we will organize workshops on topics of potential cross-Division collaboration.

Concerning current interaction with other units in the University: a few members of LFCS are also members of the Computer Systems Group, and interaction is increasing; before the formation of the Division Alan Smaill was a DAI/DCS joint lecturer and contacts between LFCS and the Mathematical Reasoning Group have always been strong; LFCS members currently hold or have recently held joint grants with members of CSG, the former DAI and Cognitive Science departments, HCRC, Sociology and the Management School, and have co-supervised Ph.D. students in most of these plus (at least) Chemical Engineering.

Organization and structure

Membership

The current LFCS membership includes 16 members of teaching staff, 18 postdoctoral research fellows (including 2 members of teaching staff on fellowships), and 20 research students. All of the current members of teaching staff who belong to LFCS have agreed to be listed on this application as primary members of the proposed institute:

Samson Abramsky	Mark Jerrum
Stuart Anderson	Kyriakos Kalorkoti
Julian Bradfield	Roni Khardon
Rod Burstall	Gordon Plotkin
Martin Escardo	Don Sannella
Mike Fourman	Alex Simpson
Stephen Gilmore	Alan Smaill
Jane Hillston	Ian Stark
Martin Hofmann	Colin Stirling

Most or all researchers who are currently employed to work on grants held by these people are also expected to become primary members. Here is a list of those who have so far agreed to this:

David Aspinall	John Longley
Anna Bucalo	John Power
Ewen Denney	Daniele Turi
James Laird	Martin Wehr

The following have so far agreed to be listed as secondary members:

Alan Bundy	Thomas Kleymann
Carsten Führmann	Dave Robertson
Corin Gurr	Mark Steedman
Paul Jackson	Perdita Stevens

Management structure

LFCS is managed on a day-to-day basis by its Director and Assistant Director in consultation with the Co-directors. Don Sannella is the current director of LFCS; his 3-year term expires in April 1999. One of the other Co-directors (currently Samson Abramsky, Rod Burstall, Mike Fourman, Gordon Plotkin and Colin Stirling) will succeed him and the directorship will rotate amongst the co-directors continuing previous practice.

The Research Committee, which is composed of all members of LFCS teaching staff, meets once per term. An Advisory Board composed of the Directors, representatives from the membership of LFCS, internal and external academics and industrialists, meets about once per year. Occasionally the weekly ''Lab Lunch'' meeting is devoted to an informal discussion of relevance to the whole membership of LFCS and there is a General Meeting of LFCS about once per year.

Organization of scientific activity

The direction of research done by individuals and groups in LFCS is of course the responsibility of the people involved, and similarly for the management of research grants, but LFCS provides a strong cultural environment and mutually supportive basis for this research.

Research is organized into five broad *themes*:

- Logic and Proof
- Concurrency
- Language and Semantics
- Complexity and Algorithms
- Formal Development of Programs and Systems

There is considerable overlap and cross-fertilization between these. Many research projects and most LFCS members do not fit tidily into a single theme. Also, we plan to revise this list of themes soon to reflect more accurately current research in LFCS. Still, such a classification is useful in explaining LFCS's research profile. It also provides a structure for strategic discussion of future research directions via periodic *theme reviews*.

LFCS members are encouraged to ask each other to comment on draft grant proposals. There have been occasional attempts to take a strategic view of LFCS's research portfolio but coercion to fill holes that become apparent does not go beyond indicating the existence of opportunities and encouraging appropriate candidates to apply for lectureships.

Lab Lunch is a weekly informal meeting where visitors are introduced, news is announced, and 1-2 short talks or trip reports are given. This is supplemented by *research clubs* in specific areas, and a weekly *Theory Seminar*.

Staff management

Following Divisional policy, LFCS has no line management function as regards teaching staff.

There is currently no mechanism for formal appraisal of research staff. Individual grant holders take responsibility for researchers employed by them. Cases for promotion are handled on an *ad hoc* basis by the Director in consultation with grant holders. However, LFCS supports the ideas contained in Stuart Anderson's paper on involvement of researchers in teaching (see http://www.dcs.ed.ac.uk/home/soa/teach-res.ps) and plans to institute a periodic planning and review procedure for researchers who opt into this scheme.

Plans for management of support staff in the Division seem quite unclear at present. Until now the Assistant Director has reported to the Director and other members of support staff have reported to the Assistant Director.

Grant management

Considerable benefit is derived from a centralized approach to research grant management. Grant holders are ultimately responsible for their grants but all the clerical work and most decisions concerning details of expenditure are delegated to the LFCS central administration. Most equipment money is pooled and used to buy machines when they are required rather than when grants happen to start. Personnel can effectively be shifted between grants on related topics to optimize the use of funds. The grant application process is supported to the extent that the aspiring grant holder can concentrate solely on writing the scientific case for support.

Financial management

In addition to grant funds, LFCS has accumulated some central funds including profits from running industrial courses and conferences. A scheme of *small project grants* to support initiatives that enhance the research portfolio or environment of LFCS is about to start, funded from this source.

Resources

Money

LFCS has accumulated £40-45K of central funds from surpluses on past activities. Its income from research grants is about £1M per annum, with most funding from EPSRC and ESPRIT. Apart from the cash overheads that LFCS grants bring to the University and the Division, EPSRC grants bring in recharging funds of around £55K per annum (conservative estimate). This is currently used to fund a part-time Grant Administrator and a CO post in the Division. In the last RAE submission, 21 members of LFCS were counted as Category A staff. The income to the University from SHEFC which is attributable to the research activities of these people is around £779K per annum.

LFCS's track record with grant applications is excellent and our relations with EPSRC and ESPRIT personnel are good. Our input to the formulation of new initiatives has been sought by both bodies from time to time.

The prospects for future EPSRC funding are good. Current EPSRC policy is to encourage more speculative, curiosity-driven, high-risk grants, and this is exactly the sort of research that LFCS has pursued since its inception. Also encouraged are large and multidisciplinary grants, including those involving joint funding with other research councils. LFCS can use its influence to lever funding to other areas of the Division by forming partnerships and collaborations. We have significant relationships with a number of industrial partners, which fits well with EPSRC's intention to have half of all grants carrying some form of external contribution. The following proposed or existing programmes are relevant, among others: a managed programme in Systems Engineering and Systems Integration; a new or revamped programme on Critical Systems; a programme on Distributed Information Management; a focus on developing new activities around generic IT solutions across application domains.

Most EPSRC grants in LFCS are three-year ''responsive mode'' grants. There are some grants under managed programmes, some visitors from abroad are supported by EPSRC Visiting Fellowships, and LFCS members have received a fair number of EPSRC Advanced Fellowships and Senior Fellowships over the years.

The prospects for future European funding are mixed. ESPRIT is tending to cease funding theoretical research of a foundational nature in favour of participation by theoretical groups in projects having generally practical aims. LFCS is well-positioned to contribute to such projects but has not tended to seek such opportunities in the past. A specific opportunity in Framework 5 will be a pro-active initiative in ''Globally Aware Intelligent Information Systems'' to which LFCS could respond in partnership with others in Informatics.

Academic and research staff

All members of teaching staff in LFCS occupy established or temporary posts in the Division. A few are on EPSRC fellowships or similar, and then the fellowship pays for a replacement lecturer. EPSRC research grants do not pay for the time of the principal investigator and the few ESPRIT proposals where this has been attempted have failed. Each LFCS researcher is employed to work on a specific research grant. The post of LFCS Director is a major administrative task within the Division.

Infrastructure

The administrative infrastructure of LFCS is provided by the Assistant Director (Gordon Duckett), a part-time Grant Administrator (Monika Lekuse), and a secretary (Kendal Reid). The Assistant Director is responsible for most non-scientific aspects of the running of LFCS. The Grant Administrator is supported by recharging funds from LFCS grants while the other two are supported by the Division. All three have duties outside LFCS in addition to their LFCS responsibilities. The support that these people provide for LFCS is an absolutely vital component in its success. It is essential that at least this level of support is maintained.

The LFCS computing infrastructure was originally quite separate from the computing system in the rest of DCS and was supported by separate computing staff. Nowadays LFCS equipment is seamlessly integrated with the rest of the network in Informatics South. Machines for teaching staff and research students are currently provided mainly by the Division, and at least this level of central provision must be maintained. Machines for researchers and shared servers are provided from grants.

Don Sannella.

Last modified: Thu Oct 1 11:40:38 BST 1998