

Rainer Schöpf

Rainer Schöpf was a co-founder of the $\text{\LaTeX} 2_{\epsilon}$ and CTAN projects, and is still a key maintainer of CTAN. [Interview completed 27 August 2007.]



Dave Walden, interviewer: Please tell me a bit about your personal history independent of \TeX .

Rainer Schöpf, interviewee: I grew up in a town not far away from the city of Mainz, and consequently I went to university there, studying physics. When I started my studies I couldn't think of doing anything else, although I didn't have a very clear idea of what I would do later. My specialty was elementary particle physics; I did a PhD thesis in string theory — a very hot topic in the mid-eighties.

During my thesis I spent a lot of time on playing with computers, one topic in particular being computer algebra. REDUCE was what some theoretical physicists used, so I became involved with the people developing it. I spent a year at the University of Heidelberg, but realized early that this wasn't what I wanted to do. This was in spring 1990 — half a year after the Berlin wall came down. I combined a trip to the reunified city with a visit to the Konrad-Zuse-Zentrum für Informationstechnik Berlin — and soon had a new job doing computer algebra and combined symbolic-numeric methods.

Unfortunately, this was only a temporary position, until 1994. I found another job, again in Mainz at the university computing centre, supporting the Unix systems. At that time, Linux was still a rather new system, lacking many of the features that the more mature commercial Unices offered. There was a lot of them: if I remember correctly we supported nine or ten different computer architectures. 64-bit systems were new; a lot of software didn't work very well in 64-bit mode. For example, I spent a few days trying to find out why Ghostscript wouldn't run on the DEC Alpha with OSF/1. Of course, it always came down to tacit assumptions on the programmer's side: casting pointers to ints and back, assuming that pointers are 32-bit long, assumptions about signedness, and so on.

The six years I worked there were an exciting time, because many old assumptions about how computers are used changed: they brought the rise of Windows and Linux as real operating systems, more or less pushing everything else out of the mainstream; the coming of the World Wide Web, and SPAM. At the same time, many good ideas and systems were abandoned (too many to list).

In 2000, I joined the newly founded biotech company ProteoSys, where I still work, doing systems support and developing specialized software.

DW: When and how did you first get involved with \TeX ?

RS: Around 1983 or 84, I'm not sure. My first contact was an article in the DFG-Nachrichten, the printed newsletter of the Deutsche Forschungsgesellschaft (German Research Foundation). I was intrigued by the report of that group in Bonn. Some time later, I came to know Roderich Schupp, a student from the math department. He had somehow managed to get hold of \TeX and to get it running on the Multics university computer system. However, there was no output device suitable for \TeX , so he wrote a DVI interpreter in PL/1 that drove the hardcopy device for the HP graphics terminals. Can you imagine printing 300 dpi output on such a 50 dpi device? It was loud, it was slow, and it produced sheets with only part of a page. I typed my diploma theses with a typewriter instead.

Over time, the situation improved. The physics institute acquired their own new VAX/VMS computer system with two DEC LN03 laser printers. Now we could produce DEK's "masterpieces of the typesetting art".

During that time I met "this other guy from the math department who supported \TeX there", Frank Mittelbach. He often came over to our institute, it was in the next building, and we physicists had larger workrooms (ours had been intended as a lab), and always a cup of tea ready.

DW: Did you eventually begin to use \TeX as well as support it?

RS: Oh yes. This came with \TeX for the Atari ST series of computers. I bought my first Atari 1040 ST in 1985, together with other students. When I could first get my hands on a Pascal compiler I tried to compile \TeX on it, but didn't succeed. Others did: there was the group of people around Joachim Schrod in Darmstadt, and two guys from the Nuremberg area (Stefan Lindner and Lutz Birkhahn) who eventually produced the free \TeX and Metafont implementation for Atari, including DVI drivers for dot matrix printers. Then we could finally run \TeX and print the output. A lot of the early work was done on the Atari (including part of the AMS- \LaTeX development in 1989/1990).

DW: Is there any use of \TeX in the biotech world—do you support it, among other things, at ProteoSys?

RS: There are applications in the biotech world. To give one example: the `texshade` package for typesetting peptide and nucleotide alignments. However, I'm afraid we do not really use \TeX at ProteoSys, the main reason being interoperability. There are de facto standards for documents being exchanged between collaborators, and \TeX isn't one of them.

DW: You are well known for taking over \LaTeX maintenance from Leslie Lamport and then developing $\LaTeX 2_{\epsilon}$, for developing the New Font Selection Scheme, and for your contributions to AMS- \LaTeX , among other things. In the *TUGboat* author list I see the following papers, all but the first of which were jointly written with Frank Mittelbach:

- Drawing histogram bars inside the \LaTeX `picture`-environment (issue 10:1, April 1989)
- A new font selection scheme for \TeX macro packages—the basic macros (issue 10:2, July 1989)
- Towards $\LaTeX 2.10$ (issue 10:3, November 1989)
- With \LaTeX into the nineties (issue 10:4, December 1989)
- The new font family selection—User interface to standard \LaTeX (issue 11:1, April 1990; reprinted in 11:2, June 1990)
- A new implementation of the \LaTeX `verbatim` and `verbatim*` environments, A

(issue 11:2, June 1990)

- Towards L^AT_EX 3.0 (issue 12:1, March 1991)

How did your deepening involvement with L^AT_EX development come about, and what was your motivation for spending your time this way? Apparently you were pretty intensely involved for about a two-year period from 1989–1991; had this intense work actually started well before 1989?

RS: The dates on the *TUGboat* articles are misleading; *TUGboat* had a fair backlog then. NFSS, the New Font Selection Scheme, was conceived and first implemented well before 1989, possibly even in 1987—although I find it difficult to attach an exact date. The histogram bar package is even older.

RS: Frank Mittelbach and I shared an interest in T_EX and L^AT_EX early on. At first, L^AT_EX didn't fit in the small computers' memory. But when that changed, it was obvious to us that L^AT_EX would be the way to go for the typical user. At the same time, we became aware of its shortcomings: its fixed set of fonts, its lack of complex mathematical typesetting, its US-centrism in layout. The problem was not that you couldn't change these things, but that this created mutually incompatible variants.

I think it was in 1986 that we could finally send and receive emails via the university mainframe computer. I do not recall when we sent the first email to Leslie Lamport, or when we received his first reply. Eventually, the connection became better; we reported and corrected a number of bugs, discussed improvements and changes. We discovered some T_EX bugs as well.

Out of this grew a number of extensions, like NFSS or Frank's `multicol` environment for balanced multicolumn typesetting. We knew how we wanted L^AT_EX to evolve, but Leslie would not develop it further. When Frank won the 1989 Knuth scholarship, he went to Stanford for the 1989 TUG conference and met Leslie and DEK in person. Leslie agreed that we would continue L^AT_EX development; the plan for L^AT_EX3 was hatched. It was not only us two: Chris Rowley was there from the beginning; others joined us later. So we became what is now called the L^AT_EX Project.

AMS-L^AT_EX was done in winter 1989/1990. The AMS wanted to use the extra math fonts and math typesetting capabilities of AMS-T_EX in L^AT_EX. We convinced them that everything should adhere to L^AT_EX syntax, and implemented the first version. However, one big problem remained: AMS-L^AT_EX, as well as other extensions, was different and slightly incompatible, required separate format files and separate commands for running. In 1994, L^AT_EX2_ε solved this, by incorporating all the changes and improvements we wanted back in 1989. [*See endnote. -Ed.*]

DW: How did you and Frank work together?

RS: That's difficult to describe. It just sort of happened. Sitting together nearly every day and tossing ideas about was very important. Only after I had left Mainz (when we worked on AMS-L^AT_EX) did we divide the work. Even then we needed the regular meetings. Fortunately, Heidelberg isn't far away from Mainz. It became more difficult when I moved to Berlin a year later. We talked a lot on the phone, but couldn't meet as much as before. Fortunately, email had become an easy way of communication.

DW: How, if at all, did NTS (<http://nts.tug.org>) relate to all of the above?

RS: In 1989, Don Knuth made the last change to T_EX and Metafont. It was obvious to many people that this could not be the end. Even DEK himself lists a number of possible improvements which would not be implemented. Stability is good, but stagnation isn't.

The NTS group wanted to build on T_EX, using its stability to progress. I soon realized

that I couldn't put in the necessary effort and effectively dropped out of the project. I think we were too naive: we underestimated the amount of work and overestimated our influence. Creating PDF instead of DVI, or 16-bit input and fonts with more than 256 characters are much more important than some changes in the macro language. Graphics inclusion is no longer the problem it was 15 years ago. At the same time, other (commercial) programs have improved a lot.

DW: Today I think that perhaps your main involvement with \TeX is with CTAN. The interviews of Jim Hefferon and Robin Fairbairns speak somewhat to that. How did you come to be involved, and what keeps you involved?

RS: I'm still with the \LaTeX Project, although I do a lot less now. What keeps me involved with CTAN... that's a good question. There seems to be no one else...

In the early nineties, I helped with maintaining the German \TeX software repository, at that time an ftp server at the University of Stuttgart. Naturally, I was involved in discussions with the other repository people. So, I became one of the maintainers when CTAN started, and never managed to run away :-)

As far as \TeX is concerned, CTAN takes up most of my time, that's for certain. It would be nice to delegate the routine work and spend more time on improvements. But volunteers do not grow on trees, and even the routine tasks have a pretty steep learning curve.

It is perhaps interesting to note how CTAN reflects the change in \TeX usage. Nowadays, the bulk of downloads (80 percent) are Mac \TeX , MiK \TeX , and \TeX Live. When a major new version comes out we have to be careful to not exceed our bandwidth limits.

I do take a certain pride in the fact that CTAN predates CPAN for Perl. CPAN is definitely better organized, has more software, more mirror sites, better interfaces, and so on. But we were there first! :-)

DW: You have been deeply involved in at least two major advances in the \TeX world—the development of $\LaTeX 2_{\epsilon}$ /AMS- \LaTeX and the development of CTAN. Do you see yourself again contributing in as major a way as you did previously, or has the center of initiative passed on to a new generation of \TeX developers? More generally, do you in fact see \TeX as remaining viable going forward?

RS: Without doubt, there is a new generation of developers, maybe even two generations. My interests have changed; I'm content that others have taken up the work. CTAN alone is enough to keep me busy.

\TeX as such is stable and frozen, so there will not be much progress with \TeX itself. It gives us a basis for typesetting our documents and for further development. Of course, there are a lot of add-ons that we didn't imagine 20 years ago. Think of the wonderful things Hans Hagen does in Con \TeX t, or look at PStricks! Still, I believe that there is room and need for change. Occasionally, I'm surprised by someone stating that \TeX has everything we need. That wasn't even true in the eighties, when computers were much smaller and slower than they are now. And let's not forget that other programs—competitors—have improved over time. \TeX is no longer ten or fifteen years ahead. Ease of use has become more important, even more for some than quality of typesetting.

Fortunately, there are a lot of projects going forward. Whether these developments can keep \TeX alive in the long run remains to be seen.

DW: Thank you for participating in this interview. I have heard your name since I first heard of \LaTeX and it has been a pleasure to get acquainted with you, if only by email. I hope that if your work for a biotech company ever brings you to the Boston area (lots of

biotech effort is going on here), we will be able to meet in person.

[Endnote from DW. There are complementary additions to Rainer's sketch of his history with \LaTeX on pages 1–6 of the second edition of *The \LaTeX Companion* and in Rainer's foreword to George Grätzer's 4th edition of his \LaTeX book, *More Math Into \LaTeX* . For the latter, see pages xxi–xxiii at http://www.ctan.org/info/Math_into_LaTeX-4/Short_Course.pdf.]