High Performance Fortran tutorial and workshop

University of Southampton and Chilworth Manor, Southampton, UK.

10-11 October 1995

High Performance Fortran (HPF) is an informal standard for extensions to Fortran 90 to assist its implementation on parallel computers, especially for data parallel computations. It was developed in 1992-93 by a working group comprising representatives of most parallel computer manufacturers, several compiler vendors and a number of leading academic research groups in the field of parallel computation. The HPF extensions include:

- directives for specifying the distribution of data over 'processor memories', and for identifying INDEPENDENT DO loops;
- FORALL statements for expressing general data-parallel assignments, and PURE procedures which allow functional parallelism;
- a library of useful data-parallel operations;

HPF's FORALL constructs and PURE procedures will be incorporated in the next revision of the full Fortran standard, due in 1996.

Thus the basic idea of HPF is that, by the addition of simple directives to a Fortran program it can be executed in parallel on multi-processor machines, including workstation networks and parallel computers like the Cray T3D and the IBM SP2. This method of programming is simpler, quicker, more portable and easier to maintain than programming with explicit message-passing.

A few commercial Subset HPF compilers are already available and more are imminent. Also, Southampton University High Performance Computing Centre has developed a Subset HPF compilation system, *shpf*, which will be made freely available for educational and academic research use. It has been designed to be widely portable. It translates HPF into standard Fortran 90 with calls to a purpose-built runtime library built on MPI (the new message-passing standard).

With the availability of HPF implementations, this seems an appropriate time to hold an HPF tutorial and workshop to increase awareness and knowledge of HPF.

TUTORIAL AND WORKSHOP OUTLINE

There will be a tutorial on HPF and relevant features of Fortran 90 on the afternoon of Tuesday 10 October at Southampton University. It will consist of lectures plus hands-on programming exercises using the 'shpf' system on workstations. Some knowledge of Fortran 77 will be assumed, but no knowledge of Fortran 90 or HPF is required.

A one-day workshop on HPF will be held on Wednesday 11 October at Chilworth Manor (about 4 miles from the main university campus).

These events are aimed particularly at those involved in Fortran program development in any scientific or engineering field. They are intended to be educational, and to provide some knowledge of the uses, limitations, availability, current research and future plans of HPF. Delegates may attend either or both events.

The tutorial and workshop are supported by a grant from the JISC New Technology Initiative. They will be free of charge to staff and students from UK higher education establishments, including lunches and refreshments. A fee is payable by other delegates (see registration form).

Further details and an email registration form are available on request from

email: dbc@ecs.soton.ac.uk

Completed registration forms may be returned to

post: Christine Collier,
Room 2041, Zepler building,
University of Southampton,
Southampton, S017 1BJ.
U.K.
fax: (+44) 01703 592865 (FAO Christine Collier)

Deadline for registration is Friday 29 September.
Updates will be available on the Web at:

`http://www.hpcc.ecs.soton.ac.uk/~dbc/hpf-workshop.html`

HPF tutorial, Tuesday 10 October

The tutorial will take place on the main campus, University of Southampton.
See `http://www.hpcc.ecs.soton.ac.uk/~dbc/hpf-workshop.html` *for further details.*

13.00 - 14.00: LUNCH AVAILABLE

14.00 - 17.30: Tutorial
(lecture + coffee break + hands-on programming exercises).

HPF workshop, Wednesday 11 October

The workshop will take place at Chilworth Manor Conference Centre, Chilworth, Southampton, S09 1BX.

09.30 - 10.00: REGISTRATION

10.00 - 11.00: Welcome + keynote address
Welcome address
Tony Hey (Head of Department, Electronics and Comupter Science, U. Southampton),

Vienna Fortran extensions for HPF2
Barbara Chapman (Director, European Centre for Parallel Computing at Vienna, Austria)

11.00 - 11.30: BREAK

11.30 - 13.00: HPF systems
shpf*: a Subset HPF compilation system*
John Merlin and Bryan Carpenter (U. Southampton)

Optimisations in the HPF compilation system ADAPTOR
Thomas Brandes (GMD, Germany)

The N.A. Software HPF Toolset
Mike Delves (N.A. Software, Liverpool)

13.00 - 14.00: LUNCH

14.00 - 15.30: HPF user experiences
Parallel Integrated Forecasting System (IFS): Message-passing versus HPF
Fritz Wollenweber (European Centre for Medium-Range Weather Forecasting, Reading)

Practical experiences in HPF
David Greco (CRS4, Cagliari, Italy)

Porting the GENESIS *benchmarks to HPF.*
Vladimir Getov (U. Southampton + U. Westminster) and Bryan Carpenter (U. Southampton)

15.30 - 16.00: BREAK

16.00 - 17.30: *JISC sites feedback on HPF, and panel discussion*

17.30 :CLOSE OF WORKSHOP

HPF tutorial and workshop registration form

Southampton University and Chilworth Manor, Southampton.
10 - 11 October 1995

Name: ____
Institution: ____
Address: ____
____
____
Email: ____
Telephone: ____________________ FAX: _____________________

Please tick those events you will attend:

HPF tutorial (10 October): ☐ HPF workshop (11 October): ☐

The tutorial and workshop are free of charge to students and staff of UK higher education establishments. Otherwise the following fees apply:

HPF tutorial (incl. refreshments + lunch):	60 pounds
HPF workshop (incl. refreshments + lunch):	100 pounds

Payment method (please tick chosen alternative):

☐ Cheque payable to "University of Southampton" (pounds, sterling).

Please send to:
Christine Collier,
Room 2041, Zepler building,
University of Southampton,
Southampton,
S017 1BJ.

☐ Bank transfer to:
Midland Bank PLC,
Southampton branch,
165 High Street,
Southampton,
S09 7Al.
sort code: 40-42-18.
a/c number: 81606263.

(Please refer to 'HPF' after your name on the transfer form.)

☐ VISA ☐ Mastercard

Cardholder's name: ____________________________________
Credit card number: ____________________________________
Expiry date: ____________________________________

Cardholder's address: ____________________________________
(Address to which ____________________________________
card bill is sent.) ____________________________________

ACCOMMODATION

If you require accommodation please make your own reservation (delegates are expected to pay their own accomodation fees). We have arranged discounted rates at the following 3 hotels. Refer to the 'HPF workshop' when booking to get these rates. Early booking is recommended, as this is "conference season". Note that Chilworth Manor is some distance from the University, and public transport connections are poor.

Chilworth Manor

Venue for the HPF workshop (but not the tutorial). 4 star, in a rural location with a good pub nearby. About 3 miles from the University and 5 miles from the city centre.

price	65 pounds bed and breakfast (incl. VAT)
tel:	(+44) 01703 767333
fax:	(+44) 01703 701743
addr:	Chilworth Manor, Chilworth, Southampton, S09 1XB.

County Hotel (formerly Southampton Moat House)

About 10 minutes walk from the University campus, 3 miles from Chilworth and 2 miles from the city centre. Close to a High Street with shops, pubs, etc.

price:	44.50 (b + b, incl VAT).
tel:	(+44) 01703 359955
fax:	(+44) 01703 583910
addr:	County Hotel, Highfield Lane, Portswood, Southampton, S017 1AQ.

The Lodge

About 1 mile from the university, 4 miles from Chilworth and 1 mile from the city centre. Close to the common and a large pub, and a few minutes walk from Portswood High Street. Mention 'University meeting' when booking.

prices:	Single room, basic	19.50 (b + b, incl VAT)
	Single room, en suite	27.50 (")
	Double room, en suite	39.50 (")
tel:	(+44) 01703 557537.	
addr:	The Lodge, 1 Winn Road, Portswood, Southampton, S017 1EH.	