JET PROPULSION LABORATORY *California Institute of Technology • 4800 Oak Grove Drive, Pasadena, California 91103*

13 December 1977
FTK:kc

Dear Colleagues:

I've finally gotten around to writing down the notes I took at our workshop. I propose sending the enclosed, plus abstracts, to the SIGNUM Newsletter. If you would like an abstract different than the one distributed at the meeting, or you didn't have one included there, please send me what you would like to have appear. If you don't want your abstract to appear, let me know that and it won't. Any additional comments you would like to make, I'll include with mine. If you feel I've been inaccurate or incomplete, please give me the details.

It was good seeing you all in Albuquerque. I hope you enjoyed it as much as I.

Best regards,

Fred

Fred T. Krogh

Telephone 354-4321 *Twx 910-588-3269* *Twx 910-588-3294*

JET PROPULSION LABORATORY *California Institute of Technology • 4800 Oak Grove Drive, Pasadena, California 91103*

25 May 1977
FTK:kc

Dear Colleagues:

When Dale Bettis was starting to organize the first ODE Circus, I agreed to host the second one. At that first meeting there seemed to be a consensus that we should try to schedule meetings close in time and place to meetings in which a good percentage of our group would be interested. Since there have been no such meetings in the L.A. area, and there is an ideal setting coming up in Albuquerque soon, I propose we meet there. SIAM is having its Fall meeting there on Oct. 31 - Nov. 2 and SIGNUM is having a meeting on Mathematical Software on Nov. 3-4.

Buddy Watts has agreed to take care of lodging and arrange for a meeting room and I will attempt to take care of other details. To begin with, I would appreciate your response to the following questionnaire.

Best regards,

Fred

Fred T. Krogh

Telephone 354-4321 *Twx 910-588-3269* *Twx 910-588-3294*

ODE WORKSHOP PARTICIPANTS

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Austin, Texas 78712

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Yorktown Heights, New York 10598

Dr. L. F. Shampine
Applied Mathematics, Div. 1722
Sandia Laboratories
Albuquerque, New Mexico 87115

Dr. Joan Walsh
University of Manchester
Department of Mathematics
M13 9PL
England

Dr. Herman A. Watts
Sandia Laboratories
Albuquerque, New Mexico 87115

ask + Return to Nora

6/3/77

Nora / John —

Attached is a copy of a tentative invitation I have received to an ODE Workshop, to be held in Albuquerque around Nov. 1, 1977 (date and duration to be set).

This is actually the third in a sequence for me, the others being at Argonne in June 1974 and in San Antonio in January 1976. The purpose is to get together the dozen or so people (worldwide) most active in the subject of numerical solution of ordinary differential equations. The benefits to LLL would be primarily long-term: gaining familiarity with the work of others; exchanging literature, codes, and ideas; setting standards for quality ODE software, etc. (The ELSODE project grew out of the last workshop.)

Tentatively, I want to attend. Would you approve (presumably as a business trip)?

OK business

Alan Hindmarsh

LAWRENCE LIVERMORE LABORATORY

F. T. Krogh
JPL

6/14/77

Dear Fred,

Enclosed is my response to your questionnaire on an ODE Workshop. It is a positive response, but it is tentative at this point. Travel restrictions here are such that I probably will not be going to the SIAM or SIGNUM meetings, but I do have approval to go to an ODE Workshop. Also, I have been trying to keep my travel to a bare minimum now anyway because of a new baby at home (our first).

It would help me if you would report back later on what the responses are from people — on who is planning to come and what the talk topics are.

Best regards,

Alan

AC Hindmarsh
NMG, L-310

University of California P.O. Box 808 Livermore, California 94550 ☐ Telephone (415) 447-1100 ☐ Telex 34-6407 AEOLLL LVMR ☐ TWX 910-386-8339 AEC LLL LVMR

A. Concerning the general time and place

1. Is it O.K. ☒ Yes ☐ No
2. Suggested alternative _____

B. Specific Times

	Like	Tentatively Would Attend	Would Not Attend
Thursday Oct. 28	– no preference –	yes	
Friday Oct. 28			
Saturday Oct. 29			
Sunday Morning Oct. 30			
Sunday Afternoon Oct. 30			
Late Friday Afternoon and Evening after SIGNUM Meeting			
Saturday Nov. 5			
Sunday Morning Nov. 6			
Sunday Afternoon Nov. 6			
Monday Nov. 7			
Tuesday Nov. 8			

Total number of days we should meet __1 __1½ (X2) minimum __2½ __3

C. List topics you would like to see discussed by the group.

① ODE software, esp. standards for capabilities and user interface

② Stiff system methods

D. If you would like to give a talk - yes

How much time would you like? 45 min. (including discussion)

Title(s) (if any)? ELSODE: An ERDA Laboratory Solver for ODE's

Abstract(s) (if any)? ELSODE is an ODE solver based on the GEAR and GEARB packages, designed jointly by people at LLL, LASL, and SLL. It user interface is based on a proposed standard call sequence which evolved from earlier workshops and discussions.

E. Give name and address for anyone you think ought to be added to the enclosed list.

Prof. Robert Skeel, U. of Ill. Comp. Sci. Dept.

F. Please give your Name A C Hindmarsh

Phone Number 447-1100, X3330 (FTS: 457-3330)

Return to: Fred T. Krogh
Jet Propulsion Laboratory
M/S 125/128
4800 Oak Grove Drive
Pasadena, CA 91103

Phone: (213) 354-6127

TENTATIVE AGENDA FOR ODE CIRCUS, ALBUQUERQUE 1977 Nov. 4-5, 1977

(Lobo – 1 room)

Friday, Nov. 4

4:45 p.m.	Initial Get Together
5:00-5:05	Arrangements
5:05-6:15	5 minutes to each participant to informally tell about their current research activities. If you have recent reports, bring them to distribute to the group.
6:45	Dinner at some place arranged by Buddy Watts
8:00-8:15	Obtain consensus on meeting schedule, the purpose of meeting, and the meaning of life.
8:15-9:30	Technical Talks ~~, or Discussions or?~~

Saturday, Nov. 5

8:30-12:15	Technical Talks
12:15-1:15	Lunch
1:15-2:00	Finish technical talks, if necessary.
2:00-6:00	Discussion topics
6:30-7:30	Dinner
8:00-9:30	More Discussion Topics

Sunday, Nov. 6

9:00-~~?~~ noon (?) ~~More Discussion Topics~~

Speaker	Time	Title (Order is Random)
Zadunaisky	30	~~Global Error Estimation~~
(6) Enright	30	Implementing Methods for Stiff Equations
(5) Skeel	45	Stiffly Stable Linear Multistep Formulas
(1) Shampine	30	~~The Initial Step for an ODE Solver~~ BVP
(4) Bickart	20	Efficient Solution Procedures for Implicit Runge-Kutta and Composite Multistep Methods
(3) Krogh	5	The Elusive G-Stop
(7) Gear	30	Oscillating Problems
(8) Hull	15	Proofs of Properties of ODE Solvers
(2) Hindmarsh	30	ELSODE: An ERDA Laboratory Solver for ODE's
(9) Bettis	30	A Variable Order Variable Step RK Algorithm
Klopfenstein	–	~~Maybe?~~
(10) Watts	15	Efficient Integ. Method for BVP's

No word as yet from

George Byrne, Arthur Sedgwick, ~~Wayne~~ Ken Jackson

Responding, but not attending

Germund Dahlquist, Ian Gladwell

Dan Watanabe, Ron Seches-Davis

Fred – On the basis of the plans you've made so far, I definitely plan to come.

Return to: Fred T. Krogh
Jet Propulsion Laboratory
M/S 125-128
4800 Oak Grove Drive
Pasadena, CA 91103

More Questions

Your Name: Alan Hindmarsh
Suggested Changes in Agenda: I am in favor of continuing on Sunday 11/6, if the others are willing, till mid-afternoon maybe.

How would you like to spend Friday evening? prepared technical talks (Get these out of the way as quickly as possible to leave room for discussion.)
Suggested Topics: In column 1 put either a number to indicate the number of minutes you would like to reserve for yourself, a "✓" to indicate you expect to say something, or a blank to indicate you don't plan to say anything. In column 2 indicate how many minutes (maximum) you would like to see set aside for discussing the item.

	1	2
✓ Design and standards for the user interface (This is the main content of my 30 min. talk)	✓	60
✓ Satisfying global error requests		30
✓ New results for stiff methods		30
✓ Testing and comparisons	✓	30
✓ Software for defined stepsize sequence and for tabular data		15
✓ Program verification and validation		15
✓ Solution of $\ddot{x} = f(t,x)$ and $\ddot{x} = f(t,x,\dot{x})$ directly		15
✓ Promising directions for development and open problems	✓	30
✓ Use of structural information for improving solutions	10	30
✓ Solving ODE's with inequality constraints		
✓ Proving properties of programs		
✓ Boundary value problems (too big a topic to fit into this workshop)		
✓ Delay differential equations		15
✓ Future Meeting - Who, When, Where, and Why? [illegible] ~1½ or 2 days now		30

How about a slot for implicit, differential/algebraic, and oscillatory problems (say 10 min for each).
Please send an abstract for your talk! Let me know if the one I sent is insufficient.

Corrections to Agenda & Roster: CIRCUS (sp.), Curtis (sp.), my area code = 415. Also, my address should include "Numerical Mathematics Group, L-310"

ODE WORKSHOP ROSTER

Expected Participants - Albuquerque 1977

Prof. Dale G. Bettis
Dept. of Aerospace Engineering
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Austin, Texas 78712

Prof. Theodore A. Bickart
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Prof. Robert D. Skeel
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Prof. Pedro Zadunaisky
Dept. de Mathematica Aplicada
Observatorio Nacional de Fisica Cosmica
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Buenos Aires, Argentina

Prof Ron Lachs-Davis
U. of Toronto

Ken Jackson
U. Toronto

North Americans not Responding but Expected in Future Years

Prof. George D. Byrne
822 Schenley Hall
University of Pittsburgh
Pittsburgh, Pennsylvania 15213

Prof. L. Wayne Jackson
University of Alberta
Edmonton, Alberta T6G 2H1
Canada

Prof. Arthur E. Sedgwick
Computer Science Department (visiting U. Ill. for 1977-78 year)
University of Toronto
Toronto, Ontario
Canada M5S 1A7

Dropped from previous lists: U. Linigar, R.K. Brayton, D. Lindberg, L. Brown, M. Gordon

Interested Parties Outside North America

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8 Munchen 2, Arcisstr. 21
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Prof. Germund Dahlquist
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Prof. P. J. Van der Houwen
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M13 9PL
England

Nov. 1977 ODE Workshop – Abstracts

ODE CIRCUS

~~SIAM Fall Meeting~~, 1977

A Variable-Step, Variable-Order Runge-Kutta Method

D. G. Bettis
TICOM, University of Texas at Austin

An explicit Runge-Kutta method is presented that is characterized by both a variable-step and a variable-order strategy. The algorithm may be used as a first through sixth order method. The function evaluations for each of the methods of different order are embedded so that there will be only nine evaluations required if solutions for each of the various orders is calculated. The coefficients for the algorithm are selected so that the truncation errors are minimized and that the stability regions are maximized for the solutions of each order.

IMPLEMENTING A METHOD FOR STIFF EQUATIONS

W. H. Enright

Department of Computer Science

University of Toronto

A new predictor-corrector version of a second derivative multistep method will be described and various implementation decisions will be discussed in detail. These implementation decisions include the use of fixed-coefficient rather than variable-coefficient formulas, the stopping criteria for the iteration scheme, the use of a 'smoothed' second derivative and the choice of a starting value (other than the predictor) for the iteration scheme. The various strategies will be justified and numerical results presented.

resulting code expected to be better than alg. of Sarafyan — different error estimate, etc.

ELSODE: An ERDA Laboratory Solver for ODE's

Alan C. Hindmarsh

Lawrence Livermore Laboratory
Livermore, California 94550

ELSODE is an ODE solver based on the GEAR and GEARB packages, designed jointly by people at LLL, LASL, and SLL. Its user interface is based on a proposed standard call sequence which evolved from earlier workshops and discussions.

The Elusive G-Stop*

Fred T. Krogh

Jet Propulsion Laboratory
Pasadena, California 91103

When solving $\frac{dy}{dt} = f(t,y)$ we use the term G-Stop to indicate a special return to the user's code when a given function $G(t,y)$ passes through zero. In many applications multiple G's are present and on any given integration step several of these G's may change sign. Since output points should be indicated in the same order as the direction of integration, additional complications arise if output at certain specified values of t are to occur during the same step and/or if some of the G's may only be computed using extrapolated values of y while others are computed using interpolation.

As if this weren't enough, noise in the computation of G can cause considerable confusion when, as commonly occurs, output points are bunched very closely together. Confusion due to noise can be eliminated by flagging a sign change in G only if $G(t+\varepsilon,y(t+\varepsilon))*G(t+h,y(t+h))>0$, where h is the integration step and ε is a very small number with the same sign as h. Note that this means a sign change which persists over an interval less than the stepsize is not flagged. We believe (confirmed by one sample) that users will ordinarily prefer no flag on sign changes of such short duration.

* This work presents the results of one phase of research carried out at the Jet Propulsion Laboratory, California Institute of Technology, under Contract No. NAS 7-100, sponsored by the National Aeronautics and Space Administration.

METHODS FOR OSCILLATING PROBLEMS

L. Petzold and C. W. Gear
Department of Computer Science
University of Illinois at Urbana-Champaign

Abstract

A "quasi-envelope" of the solution of highly oscillatory differential equations is defined. For many problems this is a smooth function which can be integrated using much larger steps than are possible for the original problem. Since the definition of the quasi-envelope is a differential equation involving an integral of the original oscillatory problem, it is necessary to integrate the original problem over a cycle of the oscillation (to average the effects of a full cycle). This information can then be extrapolated over a long (giant!) time step. Unless the period is known a priori, it is also necessary to estimate it either early in the integration (if it is fixed) or periodically (if it is slowly varying). Must assume a single large frequency (or one with harmonics).

Methods [illegible] fixed-step, explicit steps of large size.

L. F. Shampine

Soln of Sturm - Liouville Problem

Phase-amplitude formulation.

Modified form of ph.-amp. transf.

Latter is better in certain cases of large e'values, because derivatives not as large.

SAND 77-1023J

not presented at workshop

Starting an ODE Solver

by

Lawrence F. Shampine
Numerical Mathematics Division 5122
Sandia Laboratories
Albuquerque, New Mexico 87115

Abstract

A scheme is developed for the automatic selection of the initial step size for an ODE solver. Additional devices are developed to increase the reliability and efficiency of the selection for stiff problems. The question of starting the integration with zero initial values when a pure relative error control is desired is answered for some kinds of codes. Some numerical results are given to illustrate the devices and support some of the conclusions.

This work was supported by the U.S. Energy Research and Development Administration (ERDA)., Contract No. AT(29-1)-789.

ODE Workshop, Albuquerque, November 4-6, 1977

STIFFLY STABLE LINEAR MULTISTEP FORMULAS

Robert D. Skeel
University of Illinois at Urbana-Champaign

Abstract

The inclusion of less-than-A-stable formulas in a stiff solver permits increased efficiency for many ODEs. If reasonable performance of the algorithm is to be maintained for all classes of stiff problems, then there must be some mechanism for selecting formulas appropriate to the problem being solved. It is suggested that the user have the option of specifying a parameter α which would only permit the use of $A(\alpha)$-stable formulas. The possible use of linear multistep formulas in such an algorithm is discussed. In particular, new results due to A. Kong are presented on the accuracy limitations of $A(\alpha)$-stable formulas.

Shelbrol has automatic order selection for BDF which detects boundary of also stab. reg.

EFFICIENT INTEGRATION PROCESSES FOR SOLVING BOUNDARY VALUE PROBLEMS

by

H. A. Watts

We shall focus on linear two-point boundary value problems, advocating that nonlinear problems be solved by quasilinearization which results in a sequence of linear problems. The technique of interest for solving the linear two-point boundary value problem is to combine reduced superposition with an orthonormalization process. Such an approach requires integration of a number of independent solutions, defined as initial value problems. Because we are solving linear differential equations, a substantial savings in cost of evaluating the derivatives can be achieved. We are interested in numerical integration schemes which are particularly efficient in such circumstances. These aspects will be discussed and some comparisons will be shown.

JET PROPULSION LABORATORY *California Institute of Technology • 4800 Oak Grove Drive, Pasadena, California 91103*

23 August 1977
FTK:kc

Dear Colleagues:

Enclosed you should find a tentative agenda for the ODE Workshop in Albuquerque, a list of speakers with topics, a roster of ODE-people, and another questionnaire for those who plan to attend.

As I understand our (unwritten) charter, the meeting should be small and consist of people actively involved with software for ODE's. I've taken the liberty of adding a number of people from outside North America to our list even though in some cases they might not qualify under this charter, with the thought that opportunities to talk with these people are too rare to pass up. For some of these people, this will be the first notice they have had of this meeting. I want you to know that you are welcome to attend and to speak.

Although our meeting will be brief, I think it will be interesting, productive, and fun. I look forward to seeing you there.

Best regards,

Fred

Fred T. Krogh

Telephone 354-4321 *Twx 910-588-3269* *Twx 910-588-3294*

JET PROPULSION LABORATORY *California Institute of Technology • 4800 Oak Grove Drive, Pasadena, California 91103*

13 October 1977
Ref: 366.16-243
FTK:kc

Dear Colleagues:

By the time this is typed, I'll be gone on vacation until October 24th. We have a room reserved to meet in at the Hilton,

		Actual meetings
Friday, November 4:	4:30 - 10:00 p.m.	5:00 — 9:15
Saturday, November 5:	8:30 - 10:00 p.m.	8:30 - 12, 2 - 4:15, 7:30 - 10:30
Sunday, November 6:	9:00 - 12:00 noon	—

Dan Watanabe and Art Sedgwick should be added to the list of expected participants, and Buddy Watts will be talking for about 15 minutes on "Efficient Integration Methods for Solving Boundary Value Problems". With luck, I'll be better organized by the time of our meeting.

I look forward to seeing you all there.

Best regards,

Fred T. Krogh/kc

Fred T. Krogh

3
2
3
hrs.

Telephone 354-4321 *Telex 675421* *Twx 910-588-3294*

University of Illinois at Urbana-Champaign

DEPARTMENT OF COMPUTER SCIENCE
Urbana, Illinois 61801
(217) 333-4428

March 14, 1979

TO: ODE Circus Participants

FROM: Bill Gear

SUBJECT: Meeting, Friday, April 6

The ODE Circus group will meet on Friday morning, April 6 from 9:00-12:30 in rooms 237-239 of the Digital Computer Laboratory. (This is about 7 blocks from the University Inn where the conference takes place the preceding days.) The agenda includes:

1. Technical discussion on software.

   What sort of testing will be needed in future?
   Should global error estimates be a part of some standard codes?
   Are there important classes of problems besides stiff, nonstiff, and oscillatory for which we should develop packages?
   Should we be providing interfaces to other packages such as graphics software?
   Future developments in specific types of codes such as extrapolation and IRK methods.
   What can be done for difference/differential equations?

2. Should this group plan another ODE conference? If so, when and where?

3. Next Circus meeting.

baa

ODE Circus - 4/6/79

Next meeting:

- Wayne Enright considering hosting next circus, in Toronto, in ~18 mos. (fall 1980).
- Also want to have larger conference. This should be 4 days, have less parallelism, more scheduled discussion time. This would be at least 3 years away.

Papers from this mtg.:

- Currently considered for TOMS or SIANUM (4 for TOMS, 9 for SIANUM)
- A new journal is being started:
  SIAM J. on Scientific + Statistical Computing
  This is intended for algorithmic/implementational issues. Stance on codes unclear.
- H. Stetter is man. ed. of a new journal, Computing, with nearly the same scope. They accept pieces of codes, but not whole software packages.

[illegible] CIRCLE Attendance 4/3/79

R D Skeel
C L Geer
Daniel Watanabe
Fred Krogh
T. A. Bickart
Ian Gladwell
Cliff Addison
[illegible]
John Butcher
H. A. Watts
DALE G. BETTIS
11 Kamel
Ralph W. Klopfenstein
T. E. Hull
WAYNE ENRIGHT
George D. Byrne
[illegible]
Pete Deyelhardt
Larry [illegible]
[illegible] STETTER
Mitch Roth
Jack Lamsen
Linda Petzold

October 30, 1979

Dr. L. F. Shampine
Div. 5642
Sandia Laboratories
Albuquerque, NM 87185

Dear Larry:

Regarding the 1981 ODE Conference, I do not have any substantial preferences as to timing. Those with school schedules and the like should help with that decision. If there is another major meeting of interest (e.g. SIAM) in that time period, which you know about soon enough, I would prefer to see the two meetings adjacent in time. This is especially important to those coming long distances on limited budgets.

Besides myself, there are two others here whose interests include ODE-IVP methods. The complete addresses are:

1. Alan C. Hindmarsh
   Mathematics & Statistics Section
   L-300
   Lawrence Livermore Laboratory
   P. O. Box 808
   Livermore, CA 94550
2. Richard B. Hickman
   Mathematics & Statistics Section
   L-300
   Lawrence Livermore Laboratory
   P. O. Box 808
   Livermore, CA 94550
3. Jeffrey F. Painter
   Mathematics & Statistics Section
   L-502
   Lawrence Livermore Laboratory
   P. O. Box 808
   Livermore, CA 94550

Dick and Jeff will also be partly supported by BES funds for ODE work. Please add them to your mailing list for the meeting.

Please keep me informed as to plans as they develop.

Regards,

Allan

A. C. Hindmarsh

ACH/cs

P.S. - I talked to Buddy today. The idea of a poster session sounds OK if necessary to get all the presentations in, and if not done in parallel with any talks. Encourage handouts to maximize the impact of poster papers.

Sandia Laboratories

Albuquerque, New Mexico 87115

June 27, 1980

Esteemed Colleague,

Months ago we asked your advice about putting on a conference here devoted to the numerical solution of initial value problems for ordinary differential equations. It was to be a sequel to the private meetings in San Antonio and Albuquerque and to the public meeting in Urbana.

No date was good for everyone, but August 1981 looked best and we tentatively selected dates in that month. When we did this, we were aware of a conference planned in Oberwohlfach, West Germany, sometime in the summer. However, we understood it was to be very narrow in scope, quite small, and would probably have few attendees from outside Europe. Since then, we have learned that the conference was scheduled for July, 1981. It has evolved into a conference of fairly broad scope, devoted to the numerical solution of stiff differential equations. As it has turned out, it will be considerably larger than the meetings in San Antonio and Albuquerque. There will be many participants from outside Europe and, in fact, many of the attendees were at the meetings in the series that concern us. We feel that as the Oberwohlfach meeting has evolved, it is already a sequel of sorts and that there is little point to the projected meeting in Albuquerque a month later. The main difference and advantage of the proposed Albuquerque meeting is that it was to be an open meeting. It is a pity that space limitations at Oberwohlfach restrain the attendance so much, but no meeting place is ideal.

Because of the Oberwolfach meeting and other less important reasons, we are postponing the meeting we proposed here. SIAM has scheduled a week long anniversary meeting at Stanford in July 1982. This important meeting should draw attendees from around the world. We are proposing that SIAM devote a special session to the numerical solution of initial value problems for ODEs. This is not as good in some respects as a special meeting, but it has some advantages, too. Our negotiations are in an early stage, but the response has been encouraging. We would be glad to hear your thoughts about this possibility.

If you should want to arrange a meeting yourself before summer 1982 or prefer to arrange a meeting of a different kind, let us know. We shall try to be as helpful as we can.

We hope that postpoing the projected meeting does not cause you any trouble. By notifying you more than a year ahead of time, it seems likely that your plans are not far advanced.

Cordially,

Larry

Lawrence F. Shampine

Buddy

Herman A. Watts

LFS/HAW/lm

Sandia Laboratories

Albuquerque, New Mexico 87115

October 15, 1979

Working Conference on the Numerical
Solution of Initial Value Problems
for Ordinary Differential Equations
(Short Title: ODE Conference)

Esteemed Colleague,

You either attended the Numerical Ordinary Differential Equations conference at the University of Illinois last April or, we believe, you were aware of it. We are planning a sequel. This letter is to ask your advice about several matters.

The main thing we need to do now is select a date for a 3 day meeting. When do you think are good times in the period March 1, 1981 - September 30, 1981? Please be as specific as you can, and tell us why, e.g. your school gets out on a given date, it is close to a meeting many will attend, the summer is easier for taking advantage of an excursion fare, etc. Unless we receive your response before December 15, 1979, we will be unable to use your input in selecting the meeting date.

We want a meeting with much more emphasis on working together. Our plan now is that all talks will be 15 minutes long in a 20 minute time period. There would be no talks in parallel. The schedule would be 8:30 - 9:30 3 talks, 9:30 - 9:50 break, 9:50 - 10:30 2 talks, 10:30 - 12:00 working session with coffee and rolls served at 10:30, 12:00 - 1:30 lunch, 1:30 - 2:30 3 talks, 2:30 - 2:50 break, 2:50 - 3:30 2 talks, 3:30 - 5:00 working session with soft drinks and coffee served at 3:30. This same schedule would apply to all 3 days. During the working session, one room would always be available for unstructured discussions. We ask for your advice and for volunteers to lead more structured sessions. For example, John Doe might volunteer to run a session on testing software. He might serve as a chairman and arrange that several interested people be present. As another example, Srta. Fulano might ask that a room be made available for an unstructured session on implicit Runge-Kutta methods. We would set aside a room and announce it for her.

The success of such a meeting depends on who attends. We want to announce the meeting widely, and we ask those of you able to help us with this to let us know. However, we mainly want to rely on letters to potential participants. Please send us the names and complete mailing addresses of people you think would like to receive information about the meeting. Include yourself, or if you are not interested, let us know so that we shall not bother you.

Albuquerque is served by non-stop or direct flights from most of the major airports in the U. S. It has a pleasant climate. We are planning to use an attractive hotel with outside swimming pool and tennis courts. It is located next to the Old Town which has some tourist interest and a variety of restaurants. The new City Museum is also next to the hotel. Although a modest museum, it has historical exhibits of the Old West which are interesting. The Pueblo Indian Cultural Center is nearby. We would like to prepare a sheet of traveler's tips for foreigners: It does not occur to a typical American to mention that the price of a hotel room does not include breakfast because it never does in the U. S. Please bring to our attention useful facts like this that we might not think of. To make foreign travel easier, we shall definitely tell people of acceptance of talks far enough in advance that they can take advantage of APEX fares.

Whether this meeting succeeds depends on you. Any suggestions you make will be gratefully received and considered. Please communicate with either of us:

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Thanks very much for your help,

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