

Finite Element Circus

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April 26-27, 1985

Duke University

Thirty-three circus members attended the finite element circus in its first visit to Duke University. Hosted by Craig Douglas, circus members were treated to a party at Craig's home on Thursday night and luncheon on campus on Friday. On Friday evening the festivities continued with a cocktail party at Don Rose's house and dinner at Sing's at the Pines restaurant. The circus concluded on Saturday.

The circus concluded on Saturday with further revelations about the finite element method, bringing the total number of falls to twenty-one. The following poem was contributed by R. Falk.

Finite Elements - No Fluke at Duke

If you haven't been convinced by now
that finite elements are no fluke,
then get in your car or board a plane
and get yourself down to Duke.

As you listen to the experts there
expound on their latest schemes,
you'll soon agree the F.E.M.
succeeds beyond your wildest dreams..

Attendees

Craig C. Douglas ✓
Robert L. Wolpert ✓
Steve Serbin
Gerard Richter
O. Karakashian ✓
Stephen L. Kellogg ✓
Dick Eirng
Rick Fiske
George H. Gengras ✓
Manilduri ✓
Soren Jensen ✓
Larry Bales ✓
Adam Luboborski ✓
Uday Banerjee ✓
Soren Larsen ✓
Leon Greenberg ✓
Don Rose ✓
Donald French ✓
M. Cristina Squetti ✓
Jinghuang Gu ✓
Bengi Guo ✓
Randolph Bank

Gene Wachspress
B. Kellogg
Ridgway Scott
John Z ✓
Jenyl Douglas ✓
Yoshiaki Muroya
Satnam Khalsa ✓
Jim Bramble
Joe Pascutto
Bill Hager
David G. Schaff ✓
Oleg Widmer

Titles of Talks

Steve Serbin : Post-Processing the Cosine Method

Gerard Richter : Analysis of a Continuous Finite Element Scheme for Hyperbolic Equations

Soren Jensen : Dimensional Reduction for Linear & Nonlinear Problems

Manil Suri : Some new results for the p version of the finite element method.

George A. Kriegsmann : Approximation of the exterior Stokes Problem in \mathbb{R}^3

Larry Bales : Cosine Methods for Nonlinear Second Order Hyperbolic Equations

J. Bramble } Construction of Preconditioners

J. Pasciak } for 2nd Order elliptic Boundary value
A. Schatz } problems in 2 & 3 dimensions.

Sat Nam Kalsia : A symptotic behavior of finite element solutions of a reaction-diffusion equation

U. Banerjee : Lower bounds on the error in eigenvalue approximation of BVP.

D. French : The Finite Element Method in a Degenerate Elliptic Equation.

M. Cristina SQUEFF : QUASI-Projection for Mixed Methods for 2nd Order Linear Parabolic Equations

Wenhuang Lin : Behavior of the h-p and h-p versions of FEM.

Bengi Guo : The generalized geometric mesh for h-p version of FEM

Randolph Bank: Continuation methods for
nonlinear equations with parameter
dependence

Jim Douglas, Jr. - Iterative methods for mixed method
equations

Bill Hager - Preconditioning for the
penalty method

Leon Greenberg - Eigenvalue problem for
Sturm-Liouville operators.

Iwo Babuska Performance of the hp version
by program PROBE.

Finite Element Circus

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November 8-9, 1985

Brookhaven National Laboratory

After a period of more than ten years, the finite element circus once again returned to Brookhaven for its fall meeting. Arranged by host Joe Pasciak, participants were treated to a wine and cheese party at the Conference center upon arrival on Thursday night and a lunch at the dining hall on Friday. Friday evening the group gathered at the Old Inlet Inn for an excellent dinner.

Forty three members attended the Brookhaven circus with fifteen presenting talks. As is the tradition, R. Falk contributed the following:

Local Flavor

When the circus comes to Brookhaven,
All its members feel secure.
No mathematical spics can get by the guards.
Of that you can be sure.

There is one slight problem, though
And it concerns the breakfast cereal.
That unusual taste you raved about
Was honey coated nuclear material.

Attendees

J. C. R.
Thig Larsson
May Wong
Jinglong Li
Tom Hugger
Raymond S. Chay
Donald A. French
Palio Wilner
M. Cristina Squeff
Charles Elliott
Charles Goldstein
Vishwanath Gupta
John Osborn
J. L. Killough
Mary Janett Mueller
Ruth Gonzalez
Yu Dehai
Lars Teng
Ha Soo Oh
Eric Bonnetier
Shang-D. Shih

Tom Russell
Maindsuri
Soren Jensen
Doug Arnold
Dick Fair
Bernard Rubin
Joe Bosack
Peter Monk
Jim Bramble
Larry Bales
Satnam S. Khalsa
Koichi Nijima
Dingyu Chen
Panagiotis Papadakis
Patrick Noon
Mohamed Shaaban
Joel Rogers
Abdulk. Qazi
B. Kellogg
Dick Eiriny
Rida Scott
Jinchao Xun

Talks

Palocha

Evaluation theorems for
polynomials

Douglas

Mixed finite elements and iteration

S. Larsson

On semilinear parabolic equations.

F. Milner L^{∞} -error estimator for linear elasticity problems.

C Goldstein - Multigrid Preconditioners applied
to sing. Perturbation and
Sloshing problems

CHAITAN GUPTA - Superconvergence for a mixed finite element
method for elastic wave propagation in \mathbb{R}^2 .

E. Rank - An adaptive Finite-Element-Approach
to a nonlinear seepage problem

Dekao Yu - Some Asymptotically Exact A-posteriori Error Estimations
for A Feedback Finite Element Method of Bi-p Degree

M. Suri - Optimal Convergence Results for the h-p
version of the finite element method with
Quasiuniform grids.

D. Arnold - Continuous dependence on the elastic moduli
for constrained and nearly constrained materials

J. Pasciak - A Domain Decomposition

Preconditioner for three Dimensional
Problems

Sad Nam S. Khalsa : "On L^2 estimates for the FEM with 'product approximation' for semilinear elliptic problems."

Elliott : "Unstructured mesh and boundary penalty methods"

R. Scott : "Conditioning of graded-mesh problems"
(joint work w/ R.E. Bank)

Jinchao Xu, Global Superconvergence of triangular linear elements in general domain

CIRCUS AT RUTGERS.

April 18-19, 86.

Organized by Rick Falk, the Circus had its Spring meeting, who particularly succeeded in securing marvellous Spring weather.

The fifty-two people attending were treated to lunch and the hospitality of Rena and Rick.

The attendees were invited to attend Ivo's "coming of age" party this Fall.

Rick taking the day off, the stand-in poet contributed the following in the Master's style¹⁾:

In Springtime on Rutgers' fair Campus
 The Circus was having its rumpus
 "We are of singular persuasion
 And of dominant conviction
 That the d.o.f.'s shall never more
 swamp us."

1) Early period.

Mitchell Luskin
Jen Douglas J
May May
Desalle Maiti
Doug Arnold
H. Vanaja
Hae Soo Oh
Uday Banerjee
Shagi-D Shih
Adam Schuyler
Raymond J. Chy
Charan P. Gupta.
Patrick Neen
Bonnie G Brooks
Manilburi
Peter Monk
Mohamed Shaaban
Cliff Reiter
Richard Vogelin
Gerard Richter
Vassili Dougalis
Ohanas Karakashian
Larry Bates
Dehai Yu
Steve Serein

Attendees B. Kellogg
Donald French
A.K. Aziz
Dars B. Wahabzai
~~Darrell Willems~~
terevio escalle
~~Peter D. Ildemauer~~
Tom Wagger
Eric Park
Camille D'Amunzo
William B. Syprzyk
Joseph W. Jerome
R. Kent Smith
M. Cristina J. Squeff
Tremontsky Gambar
Lew Greenberg
Magne J. Dapedel
Eric Bonnetier
John Osborn
Panayiotis Papadakis
Richard J. Park
Kirk E. Jordan
Jon Bramble
Dick Ewing
Randy Banks
~~Bachir~~
Craig C. Donges

Talks

Mitchell Luskin: "Numerical Methods for
Liquid Crystals"

J. Douglas, Jr.: Mixed methods and alternating-direction
iteration

D. Marini: Two side estimates for
homogenized coefficients

Manil Suri: "A Finite Element Method for a Semilinear
Elliptic Equation"

D. French: "F.E.M. for 2-d Cahn-Hilliard Egn."

E. Rank: "Feedback in the hp-version"

C. D'Annunzio: "Nonlinear Singular Perturbation Problem with
Multiple Solutions"

W. SZYMCZAK: "An Analysis of Various Splitting for
Convection-Diffusion Problems"

M.C. SQUEEFF
(with J. Douglas
and I. Martinelli Gamba) "Simulation of the transient behavior
of the semiconductor device in
1-d."

L. Greenberg: "Monotonicity of eigenvalues of
Sturm-Liouville equations."

R. Falk: "A new mixed method for
elasticity - traction boundary conditions"

R. Bank: "Sparse Gaussian Elimination
Requires no Integer Storage"
(with R. K. Smith)

Dehao Yu : "The a posteriori error estimator and its modifications near Singularity for feedback biquadratic finite element method".

Babuska + Osborn Error in the eigenvalues
computed by FEA for multiple eigenvalues

S. P. Mhalgi, Large time error estimates for spatially discrete approximations of asymptotically stable solutions of semilinear parabolic equations with nonsmooth initial data.

Craig Douglas ~~multigrid~~
Multigrid and Aggregation/Disaggregation Techniques
for Multiple Processors

B. Kellogg - Finding the eigenvalue of
largest real part

O. Widlund An Extension Theorem for Finite Element
Functions with an Application to Domain Decomposition

Finite Element Circus

The Fall 1986 Finite Element Circus convened in Knoxville, Tennessee on November 15. Steve Gerkin was the host for the conference which had a lower attendance than usual, 15 people. Ivo, again the ringmaster, commented that he was the guilty one since his birthday party meeting earlier this Fall may have influenced people not to attend.

On Friday, a sunny day, the participants were treated to a pleasant lunch in the student center and while walking back viewed the 90,000 seat football stadium. Dinner was held in a local restaurant which had several nice seafood entrees and a good selection of southern desserts.

Finite Elephants in Tennessee

The circus came to Knoxville.

A pleasant southern city.

The weather was quite cold,
and we found this a pity.

Despite the low temperature;
the sun was very bright.

We viewed the "volunteer" town
in an illuminating orange light.

Ivo's talk was propaganda,
He wanted more computations.
To solve the engineer's problems,
and relieve his own agitations.

Many jugglers and mathematicians were missing.
The attendance was quite small.
But the conference was a success,
and this was agreed to by us all!

alludes

P.W.E.

Hae-Soo Oh

Steve Serbin

Bill Layton

J Allen Croider

Manil Suri

Eric P. Stephan

Tsu-Fen Chen - Dept of Math. Iowa State Univ.
Larvy Bales Ames, IA 50014

B. Meier (v. Ilin)

John Olson

Don French

Bengi Guo

R.P. SONI, Dept. of MATH., Univ. of Tennessee
Knoxville, TN 37996-1300

Talks

- I. Babuska) The search for an ideal element
The conforming principles
- Wachsmuth Infinitesimal Scaling of H. Harnwitz
- Steve Serbin - Some Methods for Second-Order Nonlinear ODE's
- Don French - Numerical results for the 1-D Cahn-Hilliard equation.
- Hae-Soo Oh - The R-Version and h-p Version of Finite Element Method for Elliptic Boundary Value problems on Unbounded Domains
- Bill Layton - Stability Barriers in the Plane
- Steve Keeling - Galerkin/Runge-Kutta Discretizations for Parabolic PDE's.
- John Osborn - Finite Element Approximation of multiple Eigenvalues
- Charles Kora Kashian Time-stepping methods for the Generalized KdV equation
- Gérard Barry - Solution of large systems of linear equations with parallel techniques
- Manil Suri The $H^{1/2}$ and $H^{-1/2}$ orthogonal projections.
- Ernst Stephan Boundary element methods for screen problems
- Tsu-Fen Chen - Least Squares Finite Element Simulation of Transonic Flows

An "electrotechnical" method for solution of
five-point grid equations.

Bengi Guo : The h-p version of FEM with Curved
boundary.

Finite Element Circus

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Brookhaven Laboratory April 24-25, 1987

The Spring, 1987 circus was held at Brookhaven and hosted by Joe Pasciak and Charlie Goldstein, thirty-nine circus members attended with twenty-one giving talks. Lunch was provided by the hosts in the Brookhaven dining hall and the group had Friday dinner at the Old Inlet Inn.

I missed the circus in Tennessee
and now the next one's here.

It's time to sum the progress
in finite elements this year.

Alas, this time I have failed
my poetic mission.

I couldn't find a word to rhyme
with domain decomposition.

R. Falk

Attendees

Rick Falk
Kenneth Eriksson
Graud Richter
Uday Banerjee
John Ostom
Bam Cayco-Hajic
Bengji Guo
Abdulk. Azziz
Jen Hugger
Weimin Han
Li Wang
Jan Mandel
Peter Monk
Jinchao Xu
Ping Lee
Dingou Chen
Satnam Khalsa
Shagi-Di Shih
Jeliz
B. Kellogg
Craig C. Douglas

Jim Douglas ✓
Bill Hager
Jim Branwill
Yonghoon Kwon
Allen D. Williams
Eric Bonnetier
Terence Scapellie
V. Vanaja
Leon Greenberg
Michel Crowzeix
Cheng sheng jiang
Inja Lee
Ricardo Dimán
May Wong
Mark Goldstein
Joe Pasquale
Sig Garsson
Christoph Glensel

Talk

Douglas - (and Santos) Wave propagation in composite media

Falk (and Arnold) A Uniformly Accurate Finite Element method for the Mindlin-Reissner Plate

Richter - An Optimal Order Error Estimate for the Discontinuous Galerkin method

Osbourn (and Babuska) Remarks on the appearance of multiple eigenvalues

Bangji Guo (with Ivo Babuska)

The h-p version of FEM for the problem with non homogeneous Dirichlet Data

Peter Monk (with Kadir Aziz)

Continuous finite elements in space and time
for the heat equation.

Jinchao Xu (with J. Bramble & J. Pasciak)

An analysis of some multigrid algorithms for nonsymmetric or indefinite elliptic problems

TERENZO SCAPOLLA (and Ivo BABUŠKA)

Some computational aspects of the F.E.M.

Eric Bonnetier (& Ivo Babuška)

Mathematical treatment of uncertainties in input data
for Elliptic PDE's.

Allan D. Williams

Modularizing Finite Element Computation

Satnam Kholza Numerical analysis of traveling waves for
a reaction-diffusion equation.

Joe Pasciak: Convergence estimates for multigrid problems.

Charles Goldstein: The numerical solution of convection diffusion problems using multigrid preconditioners

I. Babuška

Frontal Element method for nearly ~~fully~~ dispersive problems and dimension reduction

B. Kellogg

Flow directed Gauss Seidel iterations

C. Schwab

(joint work with Ivo Babuška)

Dimension reduction for elliptic problems on "thin" domains.

Steve Keeling

Computational Results on Galerkin/Runge-Kutta Discretizations for Parabolic PDE's

Craig Douglas

Applying a PDE Technique to a Complexity Problem

Kenneth Eriksson: Adaptive FEM for Elliptic and
Parabolic problems
(joint work with C. Johnson)

Leon Greenberg

Sturm sequences for nonlinear
eigenvalue problems.

Finite Element Circus

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Cornell University Nov 13-14, 1987

The circus, hosted by J. Bramble and MSI, was of record size, with about 28 talks. The talks were organized 3 per hour on a strict schedule, and went smoothly. A cocktail party at the Bramble summer cottage, down a dark slope from the road, was followed by dinner at the Cayuga Inn.

In the absence of Rick Falk, 3 poets offered their works

28 speakers at Cornell,

12 minutes for each before the bell.

If any of them longer should dwell,

Ivo, get up and give them hell.

M. Suri

(To the tune of a popular school song)

High above Cayuga's waters

Here we meet once more

To talk about our cherished method

Our elements finite

We heard about results a' plenty,

Written down, but not written up.

Boundary elements were abundant

Dimensional reduction was expanded

(over)

There was hyperbole about hyperbolics
and a singular multigrid talk
And a graph that, connectedly, directed
Iterations to go with the flow.

R. Scott

Above the stormy, white-wine seas of Lake Cayuga
The h and p and bound'ry element battles raged
What errors were small, what condition numbers large
What fronts left unresolved

Perplexed the mighty minds.

While rude convection bestrode diffusion fair,
Gorges fingered the campus of Cornell,
Dark variational crimes were ^{confessed,} ~~committed~~,
Provisions admitted to
Then the heros retired to Bramble's hall
To toast the exploits of them all.

attendees

D. Estep
B. Kellogg
John
Mary Janett Wheeler Raffetto Lazarov
Jang Dongla & P.T. Paer-Leme
Zee Mandel Han
Dick Ewing
Ridgway Scott
Jim Bramble
Eric Baumier Clint Dawson
C. Blawie Tunde Han
Al Schatz
J. Thomas King
Tunde Han
Zhimin Zhang
Jen Hugger
John Ashton
Brendy Linn
Raymond Clay
Doug Arnold
Bengi Guo
Haedso Oh
Bruce Simpson
May Moe
Satnam Kalsia
Joe Pasquale
Tadeusz J. Janik

Adam Lutoborski
Mark Hanisch
Soren Jensen
Manileswin
Tou-Ten Chen
Jannur Pithamrata
Jas Johnson
Caloz G.
Panos Papadakis
W. Han
Jinchao Xu
Ping Lee
Bem Cayco-Hajic

Talks

Jai Douglas - Simulation of flows in naturally fractured petroleum reservoirs

JAN MANDZ: ON MULTIGRID FOR SINGULAR AND EIGENVALUE PROBLEMS

Sheng-jang Cheng - the University of Maryland visiting scholar.

Dick Ewing - Operator Splitting and Local Grid Refinement for Nonlinear Convection-Diffusion Applications

Ridgway Scott - A Model Free Boundary Problem
(joint work with Patricia Saavedra)

B. Kellogg - Flow directed iterations

for convection dominated flow (joint work with Houde Han)

R. Lazarov. Superconvergence of the gradient of FE solutions to second order elliptic problems using triangular elements

P.J. Paes-Leme. Two-phase immiscible flow in a Naturally Fractured Reservoir.

R.H. Nochetto : Weighted inf-sup condition and maximum norm error estimates for Stokes flow (joint work with R.Durán).

C. Dawson - Time-splitting for advection-dominated advection-diffusion-reaction problems

T. Arbogast - Miscible displacement in a naturally fractured reservoir

Talks

P. Noor - Coercivity of the Single Layer Heat Potential.

Bruce Simpson - Optimal incidence relations for triangular meshes, - a model problem-

May Monk - Finite Elements for Well-logging

S. Khalsa & E Bochev - Numerical computation and continuation of invariant manifolds connecting fixed points

Tadeusz J. Jamik - Finite Element method for some condensation problem

Ernst P. Stephan - A boundary element method for a first kind integral equation on open surfaces

Dan Estep - Adaptive Time Control for Semilinear Parabolic Equations (joint work with Stogner)

Tsu-Fen Chen - Effects of Grid Irregularity on Iterative methods

Juhani Pitkärauti - How to choose a basis for a Q_p -element

Claes Johnson - FEM for compressible flow (with A. Seepershy)

G. Caloz - Convergence of an inverse iteration scheme for the model plasma problem

Ch. Schwab - Dimension reduction for elliptic BVP

Houde Han A direct boundary element method for solving Signorini problems

Budd Glimm Regularity through Approximation for Conservation Laws.

Finite Element Circus

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University of Maryland May 6-7, 1988

The Spring meeting was held at the University of Maryland, the spiritual home of the Finite Element Circus. Fifty circus members attended with twenty-six giving talks.

Ivo reminded us that there is no such thing as a free lunch. However, there was a free dinner, sponsored by the Math Department, and held at Revererough Inn. This building is of great historical significance, serving as a carriage house on the road from Baltimore to Washington during the 1700's. One new fact we learned about this period was that despite his many great accomplishments, George Washington was almost completely ignorant on the subject of finite elements. ^{for example} An informed source said that George ~~had~~ thought that any pair of velocity-pressure spaces for the Stokes problem would be stable.

The Revolutionary of Finite Elements
by R. Falk

In the good old days of finite elements
You knew just where you stood.

The elements used all conformed
And behaved just as they should.

But now the integrations are reduced
And the methods all mixed and hybrid.
If this kind of nonsense doesn't stop,
I'll use finite differences instead.

A Hendees

Rick Fark

Alan E. Berger

B. Kellogg
J. W. Z.

Donald A. French

Houde Han
V. Vanaja

Ivan Greenberg

Peter J. Reichmair

Todd E. Peterson

P. Lee

Bruce Wade

Douglas N. Arnold

Donald Estep

Susanne Brenner

Shangyou Zhang

Zhimin Zhang

Bill Hager

Robert Cohen

Uday Banerjee

Inja Lee

Tadeusz J. Janik
J. Alvin Cider

Tom Hinger

Eric Baumtier
Cecilia Leme

M. Cristina J. Squeff

Mary Myle

Tobias von Petersdorf

J. Zelmer

C. Blasco

R. A. Losant

Paul B. Wahlbin

J. C. Keenlyside

Tom Russell

Howard Rubin

Weimin Han

Chamnes Karakashian

Steve Keeling

Olof Widlund

Peter Ni

A. K. Aziz

Ridgway Scott

G. Lutze

Shagi-Di Shih

Howard Elman

John Osborn

J. Khan P. Khanam

Pat Norton

Allen J. William

Hao S. Ch

William G. Sypryzak

Boutwell

Talks

R. Falk (Nonconforming Finite Elements for the Stokes problem).

Alan Berger (Analyticity of the Orientation Distribution Function for Rod-Like Particles)

B. Kellogg (Differentiability of the Balayev expansion)

I. Babuska, Implementation of essential boundary conditions for the \mathcal{J} -operator

H. Han A Numerical Scheme of Cauchy problem for Laplace equation.

V. Vanaja Iterative solution of a Forward-Backward Heat equation.

S. Brenner Multigrid methods for nonconforming finite elements

S. Zhang Multigrid methods on non-nested meshes and on tetrahedral meshes.

Z. Zhang On the Three-node Plate Bending Elements

W. Hager Approximating Electric Fields in a Thunderstorm

R. Cohen Fractional step methods for liquid crystal problems

Uday Banerjee; Effect of numerical quadrature on approximation of Eigenvalues.

Eric Baranetian Construction of a plate model for elasto-plasticity
May Muly Finite Element method for well-loggings problems

T. VON PETERSDORFF / E.P. STEPHAN : REGULARITY NEAR EXCEPTIONAL ANGLES OF THE SOLUTION OF BOUNDARY VALUE PROBLEMS IN POLYGONS

R.E. Ewing / R.D. Lazarov Superconvergence along the Gaussian lines of the mixed FEM

L.B. Wahlbin Smoothing effects in semilinear parabolic problems, and FEM.

J. Mauckel : Preconditioning for the p - Version FEM

T.F. Russell : Zero-diffusion error estimates for the modified method of characteristics

Weimin Han : Perturbation of elliptic problems on conical domains.

O. Widlund Optimal Iterative Refinement Methods.

~~Other topics~~ Parallel Finite Elements

Howard Elman Refined Error Estimates for Eigenvalue Approximation

John Osborn T. J. Janik The p-Version of FEM for parabolic problems

J. Pitkäranta : On the plate paradox

Hae-Soo Oh : Finite Element Solutions of Elliptic Boundary Value problems on Unbounded Domains.

Finite Element Circus

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Penn State University - Oct 21-22, 1988

The fall meeting of the f.e. circus was held at Penn State Univ and hosted by Rick Scott. Thirty-six circus members attended with twenty-one giving talks.

Rick Scott hosted a get-together at his apartment on Thursday night and Jerry Bona was the host for a party on Friday night. An excellent meal was enjoyed by circus members at the Golden Book restaurant.

Happy Valley - Here I Come
by R. Falk

When Happy Valley beckoned,
I was anxious to get started.
I knew the trip would take four hours.
No matter from where I departed.

~~■■■■■~~ To get to the Penn State Circus,
~~I'd~~ ~~■■■■■~~ drive through a raging inferno.
It's not that I care ~~■■■■■~~ about finite elements.
I just want a glimpse of Joe Paterno.

Attendees

Craig C. Douglas
Doug Arnold
Folke
Donald Estep
Donald French
Rick Fair
John Osborn
Wei-Chang Shann
Shangyou Zhang
Zhimin Zheng
Hsu Soo Oh
Takuya Tsuchiya
John Lovell
Charles Collier
Ridgway Scott
Jinchao Xu
Bruce Wade
Gerald Ruhk

David B. Wahlbin
V. Vanaja.
May Wang
Ch. Kewab
Dachun
Susanne Brenner
Cristina Draghicescu

Jumping Wang

Steve Serbin
Larry Bales
O. Karakashian
Jukka Saranen
Gabriel Caloz
Soren Jensen
Manilburi
Tsui Jen Chen
Ernst P. Popelar
M. J. S. A.
J. H. Chen
Todd E. Peterson
Jerry Bona
Bill Pitchard

Talks

Craig Douglas / Domain Reduction Methods

Doug Arnold / The boundary layer for the Reissner-Mindlin plate

Dan Estep / The discontinuous Galerkin method
for semilinear parabolic equations

Don French / Convergence of a FEM for a relaxed
variational problem.

R. S. Falk / Stability of a higher order
Hood-Taylor method.

S. Zhang / On multilevel spectral methods

Hae-Soo Oh / The p-Version of the Finite Element Method
for Domains with Corners and for Infinite Domains.

Charles Collins / The Computation of the Austenitic-Martensitic
Phase Transition

Ridgway Scott / Numerical computation of free-surface
problems for viscous fluid flow

Lars B. Wahlbin : A Ritz-Volterra projection and
some uses of it.

Ch. Schwab / Dimensional Reduction for
elliptic BVP

Ricardo H. Nochetto : A stable extrapolation method for
degenerate parabolic problems.

Junping Wang, A superconvergence of
Mixed Finite Element Methods on Rectangular
Domains.

Steve Serbin / Parallel Methods for the Nonhomogeneous
Heat Equation : Partial Fractions, Partial Results

Jukka Saranen / Extrapolation Solution of Boundary
Integral Equations in the Plane

Gabriel Caloz : FE approximation of the model
plasma problem

Soren Jensen : Divergence Stability for the p-version
of the FEM for Stokes problem.

Manil Suri : Uniform Convergence Results for
a class of parameter-dependent
problems.

Tsu-Ten Chen : Grid Refinement and Nonlinear SOR

Ernst P. Stephan : Improved Galerkin Methods for Integral Equations
on Polygons and Polyhedrons.

FINITE ELEMENT CIRCUS

Purdue Univ March 31 - April 1, 1989

The Spring, 1989 Circus was held on the campus of Purdue University and hosted by Jim Douglas. Forty-seven circus members attended with twenty-three giving talks.

Since a Saturday night stayover was required for lower airfares, the circus convened at 1:30 Friday afternoon and continued all day Saturday. Circus members enjoyed an excellent Chinese dinner at the Seehuan Garden on Friday evening and Jim and Mary Lew graciously provided a buffet dinner at their home on Saturday evening for those staying over.

Your Time is UP
by R. Falk

In the early years of the circus, the number of talks were few. There was no int-sup to guide us, and the h version was all we knew.

Since then we've made much progress, but the basic principle is as before, no matter how great you think your results are, You get twenty minutes and no more.

Attendees

Bruce Kellogg
Zhangxin Chen
Shangyou Zhang
John Lovell
Fabio Milner
Todd E Peterson
Donald C. French
Bruce A. Wade
Susanne C. Brenner
Ricardo H. Nochetto
William J. Semper
RAJ PAL SONI
Georgios Akrivis
Larry Bales
Todd Arbogast
Bernardo Cockburn
Bradley Lucier
May More
Mark Friedman (a.v.e. S. Khalra)
G. Caloz
John Osborn
~~Bob K. Flue~~
Rick泰尔
JC Diaz
Bill Hager
Leopoldo P. Franca

Donald Estep
Hae Soo Oh
Vince Postell
TOBIAS VON PETERSDORFF
Emory P. Stephan
El Schatz
Soren Jansen
Bum IL Hong
Yuting Wei
Manil Suri
Uday Banerjee
Xiaobing Feng
Allen W. McIunes
Kim, Dai-Gyeong
Jeff Hensley
Alessandro Russo
Dong-Woo Sheen
In-Hwan Oh
Junpeng Wong
Jimbushas T
Charan P. Gupta
Craig C. Douglas

Talks

Bruce Kellogg

fractional norm estimates for corner problems

Shangyou Zhang

Multigrid Methods on Non-nested, Non-quasiuniform & Degenerate meshes. And Moving mesh points Techniques.

Todd E Peterson

Notes on the convergence of the discontinuous Galerkin method for a scalar hyperbolic problem.

Susanne C. Brenner

A Nonconforming Multigrid Method for the Stationary Stokes Equations

Ricardo H. Nochetto

An adaptive finite element method for two-phase Stefan problems in two space variables

Todd Arbogast

The dual-porosity model from homogenization theory

Bernardo Cockburn

A new class of nonsingular discontinuous finite elements for conservation laws.

Bradley Lucier

Discontinuous solutions of nonlinear scalar conservation laws in one space dimension maintain enough regularity to be approximated to high order with moving-grid finite-element methods.

Mary Morley

Finite Element Methods for
Modeling Well-logging -
Numerical Results

Mark Friedman

numerical computation and con-
tinuation of invariant manifolds
connecting fixed points in \mathbb{R}^4 .

JCDIAZ

Approximate inverse
Preconditionings.
Exploitation of parallelism
(Theory).

Bill Hager

MULTIPLIER METHODS
FOR NONLINEAR OPTIMAL
CONTROL

Hae-Soo Oh

The Method of Auxiliary Mapping
in the Finite Element Solution of
Elliptic Boundary Value Problems
Containing Boundary or Corner Singularities

TOBIAS VON PETERSDORFF ELASTICITY PROBLEMS IN POLYMEDIA
IN \mathbb{R}^3 - SINGULARITIES AND BOUNDARY
ELEMENT METHODS WITH GRADED MESHES

Ernst P. Stephan

On the h, p and h-p versions of the
boundary element method

Al. Schatz

Supereconvergent Finite element methods
for elliptic problems in \mathbb{R}^N with
smooth and non-smooth solutions.

Lars Wahlbin
(in absentia)

Some remarks on the History of the
finite element method.

Soren Jensen

On Locking in the Performance of
the p Version of the F.E.M. for
Stokes Problem.

Manil Suri

Unlocking Poisson Locking

Uday Banerjee

Approximation of eigenvalues
of a 4th. order differential eqns.
with non-smooth coefficients

Alan W. Hines.

Using Collocation to determine the
Quadratic Function Approximation.

Alessandro Russo

On the Coupling of the
Euler and Navier-Stokes
equations (joint work with
F. Brezzi and C. Carstens)

Junping Wang

A New Family of spaces
in Mixed Finite Element
Methods

Craig C. Douglas

Domain Reduction Methods
for 1 to 3 Dimensional
PDE Problems

Leopoldo P. Franca

The Stokes problem with
various well-posed boundary
conditions: symmetric
formulations that
converge for **all** velocity-
pressure spaces
(joint work with T. J. R. Hughes
and R. Stenberg)

Donald Estep

Boundedness of Dispersive
Difference Schemes

Fabio Milner The Cahn - Hilliard Equation
of Phase Separation: The Case of
Near - Constant Mobility.

Finite Element Circus

UMBC November 10-11, 1989

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The Fall, 1989 Circus was held on the campus of UMBC and hosted by Mani Suri. Forty nine circus members attended, with twenty-seven giving talks. After nine talks on Friday afternoon, circus members drove to downtown Baltimore for an excellent dinner at Chez Fernand. On Saturday, 18 more talks were given, beginning at 9 a.m. (only 15 minutes after Ivo's projected starting time). Following the talks, Kadir Aziz hosted a party at his home for those circus members staying over.

what was that second one, again?
by R. Falk

He asks me to name the great circuses.
I say Ringling Brothers is number one with me.
Number two was the finite element circus,
Held in eighty-nine at UMBC.

What made that second circus so great?
I never even heard of it, he intones.
Well, how could I explain that to a guy
who doesn't know lions from lions.

attendees

Raymond J. Clay

JOHN FRANGENSTEIN

RODOLFO RODRIGUEZ

Ricardo H. Nochetto

ALAN E. BERGER

V. Vanaja

Gerard Richter

John Lowell

Uday Banerjee

Leon Greenberg

Junning Wang

Jim Brankle

May Wong

Rosario Marasimben

Sonia M. Garcia

Barry Smith

Ju Maudel

Ralf Sterling

Carroll Dunn

Jarki Eric Chen

Soren Jensen

Mark DRYJA

Bill Hager

A.K. Ozis

Tim L. Liu

Rouben Rostamian

Peter Monk

W.-Jg. Slyg

(Tremis scapsille)

TADEUSZ JANIK

Takuya Tsuchiya

TOBIAS VON PETERSDORFF

Jen Whagen

Steve Serbin

Tsu-Fan Chen

Manildini

Brooke Stephens

Susanne Brenner

ANDERS SZEPESSY

Hong Wang

Weimin Han

Hae Soo Oh

Ping Lee

Todd E. Peterson

Donald C. French

Be Kellogg

Berkeley A. Folk

Ping Wong
Olof Widlund

Mark Siedman

Roger Temam

William E. Symmey

Jens Markus Melencz

Talks

JOHN TRANGENSTEIN : HIGHER-ORDER GODUNOV METHODS FOR ELASTIC-PLASTIC SHOCKS

RODOLFO RODRIGUEZ : ASYMPTOTICALLY EXACT ERROR ESTIMATORS FOR RECTANGULAR FINITE ELEMENTS

R.H. Nochetto : Selfadaptive mesh modification for parabolic FDPs: theory and computation.

Gerard Richter : An explicit finite element method for convection-dominated steady state convection-diffusion equations

Jumping Wang : Norm estimates for product iterative methods.

Jim Brinkley : Multigrid estimates without elliptic regularity assumptions.

Jean Mandel : Hierarchical preconditioning and partial orthogonalization for the p-version FEM

Qihinn Zheng : Solving free-boundary value problem with the h-p version finite element methods.

Rolf Stenberg : Nonconforming methods for Reissner-Mindlin plates

Senhuei Eric Chen : Numerical Computations of discontinuous solution of a Navier-Stokes Equations.

SOREN JENSEN
TADEUSZ JANIK

An H^m_0 Interpolation Result.

The hp version of the finite element method for parabolic equations.

Takuya Tsuchiya

A-priori and A-posteriori error estimates of finite element solutions of nonlinear parametrized PDE in divergent form.

Leon Greenberg

Nonlinear eigenvalue problems for ODEs with 2-point boundary conditions.

TOBIAS VON PETERSDORFF

BOUNDARY LAYERS IN BEAMS WITH GENERAL BOUNDARY CONDITIONS

Manil Suri

On Locking and Robustness

ANDERS SZERESSY

Convergence of the Streamline Diffusion Finite Element Method for nonlinear conservation laws and incomplete iterations

Hong Wang

The convergence of some ELLAM schemes for advection dominated problems

Weimin Han

Approximating nonlinear problems by linear problems.

HAE-SOO OH

The Method of Auxiliary Mapping for the Interface Problems in the Framework of the h-p Version of the Finite Element Method

Don French - Finite Element Methods which
Preserve Energy Properties for
Nonlinear Evolution Equations

BILL HAGER - OPTIMAL PENALTIES

OLOF WIDLUND - REMARKS ON THREE NEW RESULTS
ON DOMAIN DECOMPOSITION ALGORITHMS.

ROGER TEMAM - The nonlinear Galerkin
method and the large time
approximation of nonlinear
evolution equations

BILL SZYMCZAK - An algorithm for Tree
Surface Problems using a
Generalized Hydromechanics Model.