

Brookhaven National Laboratory
March 24-25, 1995

The Spring circus at BNL was hosted
by Charlie Goldstein and Joe Pascale.
On Friday night, circus members had
an excellent dinner at the Courtyard
Cafe, one of the top 10 restaurants on
Long Island. Twenty four circus
members attended, with twelve giving
talks. The following poem was dedicated
to IVO, on his upcoming move to Texas.

"Remember the Alamo"
- well, not exactly
by R. Fair

I had a strange dream last night
about the Alamo.
I saw Davey Crockett, Daniel Boone,
and a guy they called IVO.

Then IVO spoke in his distinctive style,
but in an accent I didn't know.

"Howdy, pardners, and welcome to
the first F.E. Rodeo."

attendees

Jahr

B. Kellogg

Bill Fager

Charles Goldstein

David Pickett

Joe Posner

Shangyou Zhang

Tinshui Qin

Susanne Brenner

Xiaobo Liu

Frank Thelenburg

Thomas J. Stone

Zhimin Zhang

Jens U. Melnik

Mohamed Al-Lawatin

Al. Schatz

Felix G. Jantsch

Shari Moskow

Jae Ryong Kweon

Mats G. Larson

Peter Monk

A.K. Aziz

Sise Jusu

Zohar Yosibash.

Talks

discontinuous viscous compressible flows -

B. Kellogg

Preconditioning Divided Approximations of the
Reissner-Mindlin plate model

R. G. Faea

Least-squares approach based on a discrete
minus one inner product for first
order systems.

J. Rosink

Multigrid Uzawa Algorithm for divergence

free mixed elements.

Shangyou Zhang

Stability of the quadrilateral elements $9/(4c+1)$ and
 $9/5c$ for Stokes

Jinshui Qin

Error Analysis of a set of Galerkin FEM for a set of
coupled Helmholtz equations in one dimension.

Franz Ohlenburg

Corner Problems - Grid refinement relative error:
Superconvergence and extrapolation. Al. Schatz.

Numerical Experiments on Nonlinear
Parametrized PDEs - Felix C. J. Jantsch

Compressible Navier-Stokes equations in a bounded domain with inflow boundary

Joe Ryang Kwon

GAUSS POINT MASS LUMPING SCHEMES FOR MAXWELL'S EQUATIONS

Peter Monk

Convergence of Mann iteration processes for nonexpansive operators in metric spaces.

Soren Jensen

Numerical Analysis of Thermo-Elastic problems in 2-D.

J. Yosibash.

Adaptive Finite Element Methods for Conservation laws

Mark C. Larson

University of Maryland at Baltimore County

October 13 and 14, 1995

The Fall 1995 Circus was held at the University of Maryland at Baltimore County (UMBC) on Oct. 13 and 14. The meeting was organized by Soren Jensen, Manel Sere, and Don French, and information was disseminated via a Home Page for the first time. There were 49 attendees and 22 talks. We had an excellent dinner on Friday evening at the Warfields Restaurant.

Circus Poem

Sung to a well-known

Baltimore tune:

Oh say can you see

Thru a glass of bad lite

at UMBC

Finite elementists in full fight.

General Remarks Continued

I've announced his retirement as ~~the~~ Circus Ring Master. Doug Arnold and Rick Falk play the role in the future.

The Circus at UMBC

(by Don French and Jodd Peterson)

The circus convened in Baltimore,
And Ivo announced that he'd be no more,
Our fearless leader thru thin and thick,
But he'd give that task to Doug and Rick.

After studying Shakespeare's early scrolls,
Our interest was lost to two black holes.
The Kacanov tag-team showed us their stuff,
And we saw several other problems, all very tough.

Ivo begged us to worry about engineer's money,
And told us the h-p's was, indeed, quite sunny.
He also reminded us of old problems that still remain,
Such as how to analyze approximations on that
L-shaped domain.

Søren Jensen was the host with the most,
As all the participants were happy to boast.

As the talks passed by we came to see,
That the fine tradition of the circus was continued
at UMBC.

We now look forward to the Spring,
And the new ideas that the trip to South
Carolina would bring.

attendees

Donald A. French
Soren Jensen
Cliff Millard
Howard Elman
Mario Casarin
Todd E Peterson
Alan Berger
H. Seiden

W. J. Li
Eric Bonnetier
D. H. ...
T. van Pelt

James K. Clifton
Christos Xenophontos
Padmanabhan Seshayyer.
Igor Shimany
Zoran ...
Larry Bales

Jon ...
Louis W. Garcia
Alexander ...
Tang ...
Sheng Zhang

Peter Monk
Zhimin Zhang
Dan Stefania
Manil Suri
Brooke Stephens
Hwan-Ho Kim
Feng Wang

Shi ...
Ling Shen
Jinshui Qin
Shangyou Zhang
Jian Shen

Bruce Kellogg
Doug Arnold
Dan B. Wabbin
John Osbou

Steve Serbin
Dag ...
Anup Mukherjee

J. Z. ZHU

- Tralho
- D.A. French - DG for the Forward/Backward Heat Equation
- S. Jensen - Is Kac̆anov method ever practical?
- Alan Berger - Numerical Experiments Generating & Analyzing
for Self-affine Noise
- LK Chilton - Computational Analysis of Finite Element Methods
for Nearly Incompressible Linear Elasticity
- Christos Xenophontos - Boundary Layer Approximation
by hp -FEM.
- Igor Shimansky - A Posteriori Estimators for
Kac̆anov method.
- Peter Monk - Subgridding Finite Difference Time
Domain Methods.
- Zhimin Zhang - Some Superconvergence results.
- Jinshui Qin - Locking free finite elements for Reissner-Mindlin plates
- Jian Shen - A Block Finite Difference Scheme for
Second-Order Elliptic Problem with Dis-
continuous Coefficients.
- Bruce Kellogg - n -widths for a singular
perturbation problem
- Doug Arnold - Preconditioning in $H(\text{div})$ with
Applications to Mixed Methods
- Lars B. Wahlbin - A priori, a posteriori and adaptive
stuff in eigenvalue problems.
- Olof Widlund - Domain Decomposition for
Mortar Finite Element Methods.

Douglas B. Meade - Time-Harmonic Wave Propagation on Unbounded Domains
Eric Bonnetier : Structural shape optimization by homogenization
Arup Mukherjee - A finite element code for the
Initial data problem for colliding black holes.

Guangcao Ji } Continuous Time Galerkin Methods for Parabolic
T.E. Peterson } Equations with Time dependent coefficients,

I. Babuška } p and h - p FEM in today
engineering practice

Howard Elman } Iterative Methods for the Discrete
Navier-Stokes Equations

Manio Casarin } Diagonal Edge preconditioners for the
 p -Version and spectral element method.

University of South Carolina

April 19-20, 1996

Sue Brenner hosted the circus in Columbia, S.C. on a pleasant spring weekend. There were 49 attendees, and only 12 talks which produced a leisurely session.

There was a dinner at the faculty club on the campus, while preparations for an outdoor concert of Hootie & the Blow-Fish were underway outside. Breakfast, lunch, & snacks were provided by the hosts.

Poem by R. Falk

We came to South Carolina

To a Circus hosted by Sue

She made sure the azealas were in bloom

And got Hootie and the Blowfish to be there too

The talks proceeded at a leisurely pace

An unheard of thirty minutes was the each Speaker's due

It seems that all is well in in the finite element world

Except for Ivo, who was home with the flu.

Thought of R. Falk

I was thinking about Ivo not being at the circus and about Hootie and the Blowfish performing.

Growing up I used to watch Superman on TV and one continuing theme was that Superman and Clark Kent were never in the same place together. So it occurred to me that perhaps Ivo is one of the blowfish? Naah!

Attendees

Doug Arnold
Vladimir Dubinin
Vladimir Temlyakov
Jinshui Qin
Steve Serbin
Bill Faer
Hae Soo Oh
Yiping Mao
Zhimin Zhang
Peter Mark
John Osban
Susanne C. Bunner
Li-yeng Sung
Bob Sharpley
Doy Meade
Lyth B. Clark, Jr
Alex Antonov
H. Andreev
Mike Chernsky
Per-Gunnar Martinsson
Patrik Andersson
Brendan Lane
Chris Roscoe
Donald Adango
Thitrea
B. Popov

Aleksay Telyakovskiy
Michaela Corver
Emil Cornea
Konstantin Osholkov
Col. Benn
Guergana Petrova
Shushuang Man
Yingmi He
Ronald A. DeKoe
Alexandre J. Madariv
Yusheng Feng
Hong Wang
Bo Li
Shangyou Zhang
Lawrence Cowser
Ridgway Scott
Louis Garcia
Dan B. Wallen
Todd E. Peterson
Donald A. French
A.K. Aziz
(over)

Attended

Bruce Kellogg
Soren Jensen

Handwritten notes, possibly a name or date.

Faded handwritten text, likely bleed-through from the reverse side of the page.

Extensive faded handwritten text, including what appears to be a list or series of notes, continuing from the reverse side.

Talks

Doug Arnold - Performance of a preconditioner for the Reissner-Mindlin plate

Vladimir Temlyakov - Universal Cubature Formulas

Jinshui Qin - Some iterative methods for solving saddlepoint Problems

Peter Monk - The perfectly matched layer.

Doug Meade - A Nonoverlapping Domain Decomposition Method for the Helmholtz Equation

Ron DeVore - Linear and Non-Linear numerical methods for PDE'S AND ITS RELATION TO REGULARITY OF THE SOLUTION

Konstantin Osolkov - "Regularity" of solutions of Schroedinger equation of a free particle.

Hong Wang - An ELLAM scheme for multi-dimensional advection-diffusion equations.

Bo Li - Finite Element Analysis of Microstructure of Martensitic Crystals
(Joint work with M. Luskin).

RIDGWAY SCOTT - THE ITERATED PENALTY METHOD WITH INHOMOGENEOUS BOUNDARY CONDITIONS

Lars R. Wahlbin: L_{∞} stability of the Finite
Element Method in Parabolic Problems (joint
with A. Schatz and V. Thomée).

Soren Jensen: Existence & uniqueness of solutions to
a class of forward-backward heat equations
(joint with A.K. Aziz, D.A. French & R.B. Kellogg).

University of Tennessee

October 18-19, 1996

Steve Serbin hosted the Fall, 1996 Circus in Knoxville. After six talks on Friday, we had the circus dinner at O'charke's restaurant. After four talks Saturday morning, we were treated to lunch in the "executive dining room." Five more talks ended the meeting. Despite having no email address, Ivo has now gone high tech. He urged circus members to look at the ticom web site at <http://www.ticom.utexas.edu/ticom-torum>.

B. Fack contributed the following poem.

Ivo's Lament

We used to determine the order of speakers by drawing numbers from a hat.

Now we use a laptop computer and random numbers to do that.

Someday, we may only have a virtual circus, connecting only by computer and phone.

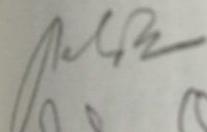
I knew when I let those new guys run the circus they would not leave well enough alone.

Attendees

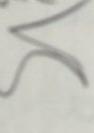
Douglas N Arnold

Vasilios Alexiades

Pierre A. Greenwood



John Osborn

Chude Col 

L. Y. Hong

O. Korakakis

Feng Wang

Jel. Io

Susanne C. Brenner

Xigang Deng

Xiabin Feng

Alexandre J. Mouchet

Clay Williams

Robert J. Starr

J. Thomas King

Tadeusz Janik

Soren Jensen

Vadim Korneev

Hankui Cheng

Hankui Wang

Laurence C Cowser

Shengyou Zhang

Da-Qing Wang

Zhimin Zhang

Steve Serbin

Eugene Isaacson

Talks

Doug Arnold: Derivation and justification of plate models

Pierre Greener: Numerical experiments about Hamilton-Jacobi and the viscosity criterion.

Prof. Barbara Lufuconiguel at the boundary elements

Al. Achatz: Some remarks on a posteriori estimates.

Chuck Collins: Convergence of a reduced integration method for computing microstructure

Feng Wang: A crosswind strip Domain Decomposition method for convection dominated problems.

O. Karakashian: Space-time Galerkin methods for the nonlinear Schrödinger equation

Joe I.: NEWS for Euler/Navier Stokes CFD Algorithms

Susanne Brenner: Multigrid Methods for Singular Solutions and Stress Intensity Factors

Xiaobing Feng: Transmission Conditions & Non-overlapping Domain Decomposition Algorithms for the Finite Element Method

Soren Jensen, Vadim Korzec: On domain decomposition preconditioning in the hierarchical p-version of the finite element method

Laurence Couderc, Analysis of Scharfetter-Gummel Finite Volume Methods for Convection-Diffusion Equations

Da-Qing Wang, A Covolume
Scheme for Electromagnetic
Scattering in 3D.

Zhimin Zhang: Finite Element Supercvergence.

Steve Serbin: Some Remarks

on Continuous Diagonally - Implicit
Runge-Kutta Methods

PROF WIDLUND: OVERLAPPING SCHWARZ
METHODS FOR MORTAR FINITE ELEMENT
METHODS.

Courant Institute

April 18-19, 1997

The Finite Element Circus paid its first visit to the Courant Institute. Olof Widlund did an excellent job as host, overcoming the substantial difficulties posed by having a circus in New York City. In fact, in order to describe the route to the restaurant and lodging, Olof was forced to use his entire 15 minute speaking time. Almost half the circus members failed the ensuing quiz on the N.Y.C. subway system.

Dinner was arranged at the Oriental Garden restaurant in Chinatown. The schedule of the talks was 8 on Friday afternoon and 14 were on Saturday.

That is a Heck of a Mesh Generator
You Have There
by Rick Falk

A circus in the Big Apple
I knew it was meant to be
when Olof showed his unstructured mesh
And it was a map of NYC.

Attendees

Richard Faer

Douglas A. Arnold

Joshua Liu

Hae-soo Oh

Pawa

Bruce Kellogg

Feng Wang

Hwanho Kim

Zhimin Zhang

Jie Shen

Li-yeng Sung

Dexuan Xie

Susanne C. Brenner

Sonia Garue

Laura Klitt

PADMANABHAN SESHAIYER

Christos Xenophontos

Vadim Korneev

Ragnar Winther

Alfred Schatz

Folkmar Bornemann
Frank Elliott Jr.

Ting Tu

Dan Lord

Jonathan Goodman

Dan Stefaniec

Tom DeLillo

Luca Pavarino

ANDREA TOSELLI

Manil Suri

Ling Shen

~~Ren~~ Anil

Arup Mukherjee

ALEXANDRE L. MADUREIRA

ION BICA

Neda Khovanskaya

Juan Carlos Aguilar V.

Bernhard Hientzsch

Yin Tzer Shih

Howard Elman

Franz Melenberg

Ralf Hiptmair

Peter Monk

Shangyou Zhang

Marcus Grote

Ashish Gupta

Abani Patra

M. Bruce Davis

Olof Widlund

David Puhst

Talks

HAE SOO OH: The Weighted Finite Element Method
for Elasticity Equations on Unbounded
Domains.

I. Babuska A posteriori error estimates
for singularly perturbed problems
(joint with M. Ainsworth)

Kellogg Forward-backward parabolic
equation (with Aziz, French, Jensen)

Z. Zhang Finite Element and Difference Methods for Some
Stochastic PDEs.

C.L. Chang ~~State Univ. of Ohio~~ Cleveland State Uni.

Piecewise linear Approximations to the Stokes Problem with
Velocity Boundary Condition.

Bengi Guo, Univ. of Manitoba
Direct and Inverse Theorems for the p -version of FEM
Based on Weighted Besov spaces; Part II: In 3 dimensions.

Dexuan Xie & L. Ridgway Scott, Courant Institute and
University of Houston. The Parallel U-cycle Method.

L. Chilton. Mixed hp elements for (nonlinear) elasticity.

P. SESHAIYER, UNIVERSITY OF MARYLAND BALTIMORE COUNTY
"UNIFORM L^p ESTIMATES FOR PARTITIONED DOMAINS"

V. Korneev Something on C^n , $n \geq 1$, curved finite
elements.

R. Winther On domain embedding preconditioners for
the Dirichlet problem.

A. Schatz and J. Wang: Aubin-Nitsche duality with H^1 regularity.
Dan Stefanica: Poincaré- and Friedrichs-Type Inequalities for
the ~~Finite~~ Mortar Finite Element Methods

M. Suri: On the Spectrum of linearized
buckling problems.

ION BICA: DOMAIN DECOMPOSITION METHODS FOR THE
P-VERSION FINITE ELEMENT

Yin-Tzer Shih: Efficient streamline upwind schemes
for Convection-Diffusion Problems.

Helman and J. O'Leary: Efficient solution of the Three-Dimensional
Helmholtz Equation

Frank Ihlenburg: Numerical Analysis of exterior Helmholtz problems with
finite & infinite elements
Rostock University,
Germany

Ralf Hiptmair: "Multigrid Method for Max-
well's equations"
(Univ. Augsburg)

Peter Monk: "Adaptive computations of far
field patterns"

Richard Fair: "Equilibrium shape of
deformable elastic crystals"

Jonathan Goodman: "Anisotropic adaptive refinement"

The Circus Comes to Cornell (by Don French)

The time to discuss finite elements once again came around
The circus was in Ithaca where Fall colors could be found
Alas, many of the usual performers did not appear
But we still gave our talks and they were all perfectly clear.

The lectures were excellent as we all would attest
Ians vigorously chased that nasty logarithm pest
John Osborn explained how badly our method could perform
And from Xinchao Xu a new multigrid algorithm was born

But the conference was quieter without Ivo to run the show
No clapping or yelling to keep us all in tow
His questioning and badgering were all part of the game
And he would not let us forget the L-shaped domain.

The Cornell circus will soon come to an end
We have now shown where all our approximate solutions will
tend

So back to our homes we must now go

To refine more meshes before the next circus show

Cornell University
October 10-11, 1997

The circus was held during two magnificent fall days on the beautiful Cornell campus.

Only 15 people spoke, and so were allocated a generous 30 minutes each.

In the absence of Rick Falk, two new poets tried their hand. On Friday

evening we enjoyed a lovely buffet dinner at the home of Lars and Anita Wahlbin.

The Fair Maiden of Ithaca (by Manil Suri)

In the land of magic and mythica,
Laid I mine eyes on the maiden of Ithaca.
I followed her to where she did dwell
In the shimmering kingdom they call Cornell.

A posteriori estimates at her feet did I lay,
Logarithms for her love I did slay.
Domains I decomposed, to amuse her
~~secrets~~ of superconvergence did I peruse her.

I hoped to win her over this way,
But my heart sank when she did say:
"Finite elements do nothing for me
I care not a whit for hp —"

If my hand 'tis your wish to secure,
Try not to be such a bore.

There's one big mistake you're making, pal—
This lady's a finite difference kinda gal!"

Attendees

Douglas N Arnold

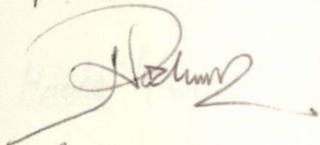
John Liu

Don B. Waldkin

Alfred H Schatz

J. Thomas Beale

Houde Han



Alexander J. Melniko

Neda Khovanskaya

Maha Nabhan

PADMANABHAN SESHAYER

Christos Xenophontos

Susanne Brenner

Dan Stefanica

John Osborn

Manile Suri

Steve Varasis

Peter Owale

Ion Bica

Varis Carey

Barbara Lohm

Edriss S. Titi

Matt Miller

Peter Monk

Joseph Coyle

Nilima Nigam.

Shangyou Zhang

Zhimin Zhang

Sheng Zhang

Xiaohui Wang

Ludmil Zikatanov

Hwanho Kim

Donald A. French

Bill Mager

Uday Banerjee

Talks

- Jinchao Xu: EAFE Scheme for convection-diffusion problems and application to conservation laws
- Lars B. Wahlbin: Stability, analyticity and almost best approximation in maximum-norm for parabolic finite element equations.
- Al. Schatz: Some remarks on a posteriori estimates for second order elliptic problems.
- Houde Han: A new mixed finite element formulation and The MAC scheme for Stokes equations
- Ricardo H. Nochetto: Optimal a posteriori error estimates for variable time-step discretizations of evolution inequalities
- Dan Stefanica (w/ Axel Klawonn): Mortar Finite Elements for the FETI Method
- John Osborn: Can a Finite Element Method Perform Arbitrarily Badly?
- Manil Suri: hp Finite Element Methods for non-Newtonian flows.
- Ion Bica: Iterative substructuring methods for the p-version finite element
- Barbara Wohlmuth: Helmholtz type decompositions as a construction tool for error estimators and iterative solvers

Edriss S. Titi: Postprocessing Galerkin Method:
A Novel Use of Approximate Inertial
Manifolds

Zhirui Zhang FE superconvergence for a singularly
perturbed problem.

Donald French Pointwise A Posteriori Error Estimates
for the Obstacle Problem

Peter Oswald multilevel solvers for $H^{-1/2}$ problems:
piecewise constant approximation

Bill Hager Euler discretization in
optimal control

University of Colorado at Denver

March 27-28, 1998

Leo Franca hosted the first circus held in Denver. After eight talks on Friday, circus members had an excellent dinner at Al Fresco restaurant. Also for the first time, circus members were supplied with nametags. After going to the circus for over 25 years, this enabled me to finally find out which one was Ivo Babuška -- he was the person not wearing a nametag.

Rocky Mountain Circus High
by R. Faek

It was the first circus ever in Denver
And Leo put on quite a show.
His web site had all the info,
And the signs told you where to go.

He got the sun to shine on the Rockies
And the snacks were the best and the most.
If Leo would only reimburse my airfare,
I'd make him permanent circus host.

Attendees

Rick Falk

Douglas N. Arnold

Alan Williams

Kyra D. Misk

Rossen Parashkerov

Bruce Wade

Hae-Soo Oh

John Osborn

Ali Nesliturk

~~Jabuta~~

MARCUS SARKIS

Susanne Brenner

ZLATKO DRMAC

Leopoldo Franca

David Duran

Tom Russel

A. SOULAIMANI

Kaul Segel

~~Ross~~

Peter J. J. J.

Shagi-Di Shih

Jay Gopalakrishnan

Tong Sun

Pandy Choo

Feng Wang

Biye Liu

Colin J. Aro, LLNL

Li Wu

Zhimin Zhang

Shangyou Zhang

Joe Pasch

Mehdi Hekt

Marian Frey

J. Wunder

A. Howard

Jack Falk

David H. Arnold

John Williams

John D. Wilson

James F. Johnson

James M. White

100-200

John Wilson

John Wilson

John Wilson

MARVIN SARKIS

James Green

ELIOT DRAC

Joseph F. Johnson

David Wilson

Tom Farnsworth

A. Howard

James F. Johnson

Talks

Douglas N. Arnold: Tetrahedra bisection

Kyau D. Zhu: A Finite Element Solver Interface Specification

Rossen Parashkevov: Flux error estimate for Mixed FEM

Bruce Wade: The weighted continuous Galerkin method for Evolution Problems

Bobančo B. Guo: New results on the p -version of FEM related to the new argument \mathcal{E}

Susanne Brenner: Lower bounds for two-level additive Schwarz preconditioners with small overlap

Hae-Soo Oh: The p -Version of the Finite Element Method for steady Incompressible Flows over Domains with Corners.

Tang Sun
Zhiqiang Cai: Long-time error estimate & stability indicator
First-Order system least squares for linear elasticity

Feng Wang: Multigrid preconditioner for the Chebyshev-Collocation method.

Biye Liu: A finite element method with streamline diffusion for compressible Navier-Stokes equations

Zhimin Zhang: Finite element superconvergent recovery for the intermediate family of the second type.

Jinn-Liang Liu: A Unified A Posteriori Error Estimation for FEM, FVM, and BEM.

Joe Pasciak: Computational scales of Sobolev

norms with application to Preconditioning

Michael Holst:

MC: A multilevel finite element code for nonlinear forms on 2- and 3-manifolds

Andrew Kuyasew
& Olof Widlund

FEM error estimates for equations with rough coefficients.

V. Druskyn

L. Knizhnerman

How to make the three-point scheme exponential convergent

Jan Mandel

Domain decomposition for plates by Lagrange multipliers

Patrick O'Leary

Shagi-Di Shih Internal Layers of Singularly Perturbed Problems

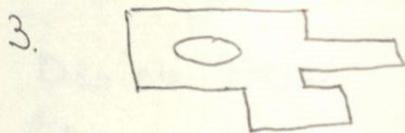
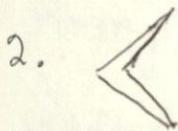
University of Maryland
November 6-7, 1998

The Finite Element Circus returned to the University of Maryland for the Fall, 1998 Circus. After ten talks on Friday, we had an excellent dinner at the Calvert House restaurant followed by a party hosted by Ricardo Nochetto. Saturday, we had a record 16 additional talks.

Inspired by the proximity to the nation's capital, R. Falk designed the following:

TEST TO DISTINGUISH BETWEEN
members of the F.E. Circus
members of Congress

Identify the following ~~shape~~ shapes:



Typical responses on following page:

Circus Member

1. Rectangular finite elements
highlighting boundary
degrees of freedom

2. Bad choice for the
shape of a quadrilateral
element

3. A difficult domain
on which to compute a
finite element solution

Member of Congress

Fund raiser
seating chart
highlighting seats
of large donors

Good choice for
the shape of my
congressional
district after the
next census

Diagram of office
complex surrounding
the oval office as
shown in the
Starr report



A Hendee
Arik Faek
Marcus Sarkis
Jinchao Xu
David Sidilkover
Ricardo H. Nochetto
Jan Chleboun

~~Salvo~~
~~Agustina~~

Bo Li

Hae-Soo Oh

Jade E Peterson

dan B. Walker

Kathie Galt

Sungjin Lee

Hoonjoo Kim

~~Pyeonggi~~

Daniele Boffi

ALEXANDRE MADUREIRA

Arun Mukherjee

Hwanho Kim

Susanne Brenner

Manil Suri

Christos Xenophontos

Sonia Pagnani

Douglas N Arnold
Kogneda Khovanskaya

~~Di Huy~~

Karen Camarda

Heinz Ungericht

A.K. Aziz

Zhimin Zhang

B. Kellogg

Aihui Zhou

Benedikt Wenzel

Dan Stefanica

PAUL MURRAY

Jung-Han Kim

Omar Lakkis

Varis Corey

S. J. Chung

Al. Schatz

Shangyou Zhang

Uday Banerjee

SAIKAT DEY

Joseph Shirron

Xiaohai Liao

Kittisak Chayantrakon

Peter Oswald

Tobias von Petersdoff

Talks

Rick Falk: New Locking Free Finite Elements for the Reissner-Mindlin plate

Marcus SARKIS: Discretizations on overlapping non-matching grids.

Jinchao Xu: Some local/parallel methods for Elliptic Problems

David Siddekov: Factorizable schemes for the equations of fluid flow

Ricardo H. Nochetto: Positivity Preserving Finite Element Interpolation and Applications

Jan Chleboun: On a problem with uncertain input data: Quasilinear steady heat flow equation.

Olof WIDLUND: Iterative Substructuring Methods for Vector Field Finite Element Discretizations

Bo Li: Finite element modeling of Microstructure near an interface between twined layers and homogeneous state.

Lars B. Wahlbin: Asymptotically exact a posteriori error estimators for the gradient on each element in nonuniform meshes (with Hoffmann, Schatz, Wittum)

Matthias K. Gilbert: A Survey of Finite Elements for the Computation of Crystalline Microstructure

Daniela Boffi: A penalty method for Maxwell eigpb.

Hwanho Kim: Some Multi-level Methods for non-SPD and/or indefinite elliptic systems.

Christos Xenophontos: Application of the p-version FEM in elasto-plasticity with localization of deformation

Grigor F. Cury: Progress & Open Questions on Least-Squares Finite Elements (with A. Pehlivanov & A. Bose)

Attendee

Druskin

John Osborn

Howard Elman

Peter Monk

~~Peter Plech~~

S. Asvadurov "How to make a three-point scheme exponentially convergent, Part II - Applications to Elasticity". (with V. Druskin and L. Knizhnerman).

P. Oswald: A scheme for deriving discrete harmonic extension operators within the additive Schwarz method

Doug Arnold: Multigrid in $H(\text{div})$ and $H(\text{curl})$

L. ZIKATANOV "A multigrid method using graph level sets"

Al. Schatz Some improved pointwise estimates for differences are discussed.

Dexuan Xie : Symmetric PSOR as an
Efficient Parallel Preconditioner

Xuejun Zhang : Least-squares finite element
method for div-curl systems

M. Grillakis U.M.C.P.

B. Kellogg : best approximation
(n -width) for 1 dimensional Helmholtz eqn

Tong Sun : Object-oriented Programming for
general mixed finite element methods

D. Stefanica : Numerical Results for the FETI method
(w/ Axel Klarwein) with Morlet Finite Elements

M. Aiffa (Penn State) : A New hierarchical basis for ^{for triangular and} tetrahedra

J. G. Liu. A Simple finite element method
for incompressible flow

Harland Glaz UMCP

Penn State University

April 16-17, 1999

Talks

- Ivan Yotov "Domain decompositions for multiphase porous media flow on multiblock domains"
- Anastasios Liaros "Weak Imposition of Boundary Conditions to the Stokes Problem"
- Michael Holst "Using Local Estimates to Decouple Adaptive Finite Element Methods"
- Feng Wang "Adaptive Multigrid Method for the Poisson-Boltzmann Equation"
- Jian-Guo Liu, "Discontinuous Galerkin method for 2D incompressible flow"
- Bruce Kellogg INFEM - a method for singularly perturbed convection-diffusion
- Denise Boff: Discrete compactness property for edge elements
- ALEXANDRE MADUREIRA Error estimator for hierarchical modeling using asymptotic expansions
- Timothy Barth A Posteriori Error Estimation and Adaptive Methods for stabilized FEM Approximations of Hyperbolic Problems

L. Zikatanov. Norms of projections
in Hilbert Space.

M. Suri Numerical Analysis of
Buckling in Thin Plates

V. Carey Locally Constrained Projections

P. Monk FE method for a micromagnetic
Problem.

Zhiping Li On the Computation of Crystalline
Microstructure

Jinchao Xu Some applications of Partition-of-unity
finite element method

Juribut G. Sibert adaptive finite elements for phase
transition problems with convection

Lars B. Wahlbin Positive finite element
approximation (with R. Nochetto)

Ricardo H. Nochetto Error Control for the Continuous
Casting Problem (w. Z. Chen and A. Schmidt)

Pedro Morin Do Adaptive Algorithms Converge?

Monique Dauge Maxwell equations and non-convex corners:
The eventuality of a numerical catastrophe

Zhimin Zhang Local Recovery Properties of SPR for
Rectangular Elements

A Attendees

Dick Fara

Douglas N Arnold

Ivan Yotov

Zhimin Zhang

Traian Iliescu

Anastasios Liakos

Michael Holst

Feng Wang

Jian-Guo Lin

Bruce Kellogg

Mohammed AIFFA

Nicolae Tarfulea

Daniela Boffi

ALEXANDRE MADUREIRA

Arup Mukherjee

Timothy Brath

Ludmil Zikatanov

Manil Suri

Ki Kuchel

Alan Dembow

Vai Carey

Aihui Zhou

Peter Monk

Peter Plechac

Wang Ming

L. Shijun

Jinchao Xu

Ping Lee

Shangyou Zhang

H. Myriller

~~Kenibat~~

Hayden Jim

Rogneda Khovanstaya

Lars B. Wehlbin

Ricardo H. Nochetto

Pedro Morin

Haranho Kim

Bojan Petrovic

Monique Dauge

Jinhae Park

NOEL HEITMANN

Azife Caglar

Bringing Back the Good Old Days
we got the order of speakers at the
first circus
By drawing numbers from a hat.

In recent times we've gone high tech
Using a random number generator to do that.

Some complained, so Doug's computer
Now makes the sounds of days gone by

If he can make it look like Mary Wheeler
we old-timers may start to cry.

R. Fall

* author's background note:

In the early circuses, Mary was
asked by IVO to draw the numbers.

** this poem provided an updated ending
to the poem of Oct, 1996.

~~Table~~

The Spring 1999 circus was held at the Hotel Atterton near the campus of Penn State University. After nine talks on Friday afternoon, a buffet dinner was held at the hotel, followed by a party at Doug Arnold's house. Twelve more talks on Saturday brought circus members up to date on the latest developments in the field. Presumably, Joe Paterno was out recruiting, so was unable to attend the circus. Although there were many x's and y's at the circus, we missed Joe's unique combination of x's and o's.

Cornell University

October 1-2, 1999

Talks

Douglas Arnold: Approximation by quadrilateral finite elements

Abani Patra

~~And~~

Tong Sun: Mass Conservation & Long-time error estimation

Ravi Narasimhan: Maximum Norm Estimates for Stokes Equations on Translation Invariant Meshes

Christos Xenophontos: On the construction of optimal meshes for the FEM for singularly perturbed problems.

Matthias Gobbert: A Homogenization Technique for the Boltzmann Equation for Chemical Vapor Deposition

Peter Oswald: On multilevel bases for divergence-free finite elements

Miu Chen: 4-dimensional dynamical systems.

Alan Demlow: Average Weighted Max-Norm Estimates for a Mixed method

Talks, contd.

Al. Schatz Asymptotic error expansions.

Lars Wahlbin. Positive finite element approximation.

Hongrong Qin Multigrid methods for harmonic map computation "Ducos."

Graham Carey Elements under "Ducos."

Pedro Morin Data Oscillation and Convergence of Adaptive FEM for Elliptic PDE

Attendees

Douglas N Arnold

Andrew Bauer

Tony Sun

Susanne C. Brunner

John Osborn

Uday Banerjee

Zou Haili

Christos Xenophontos

Matthias Gobbert

Jules Omura

Shangyan Zhang

Min Chen

Varis Carey

G. F. Carey

P. Flecha

Peter Monk

Dmitry Kopylov

Jie Shen

Zhimin Zhang

Sonia Garcia

Nicolee Tafels

Sheng Zhang

Alan Demler

Mohammed AIFFA

Hwanho Kim

Ludmil Zikabanov

Jmehad Xu

Lars B. Wahlbin

Birk Fack

Pedro Morin

The last circus of this century
was held on the Cornell campus
at Mallott Hall, the new home of
the Mathematics Department.
After 6 talks on Friday, circus
members were invited to the home
of Lars and Anita Wahlbin for a
wonderful buffet dinner. Following
6 talks on Saturday morning, circus
members were treated to a buffet
lunch at the Statler Hotel. Four
more talks then closed out the
Fall Circus on a beautiful Ithaca
weekend.

Lars Wahlbin contributed
the following poem for the
enjoyment of circus members.

Next Thousand Years.

The Millenium closes,
And so will this Circus;
Are Foundations done Right for the
next thousand years?

Is reasoning Bright,
Are arguments Tight,
Will they Live in the next
thousand years?

When Work sheds Light,
And is Bright and is Right,
It SHINES, through the next
thousand years.