FEA Information Engineering Solutions
Volume 3, Issue 10 October 2014
14th Anniversary Issue

Cray® Urika-XA™ Extreme Analytics Platform

ESI to achieve architectural excellence in Mecca and Medina

FEA Information Inc.
My Pony, Cody, and his rider Tay

First German Air Force A400M Makes Its Maiden Flight

FEA Information Inc. is a publishing company founded April 2000, incorporated in the State of California July 2000, and first published October 2000. The initial publication, FEA Information News continues today as FEA Information Engineering Solutions. The publication's aim and scope is to continue publishing technical solutions and information, for the engineering community.

FEA Information Inc. Publishes:

FEA Information Engineering Solutions
FEA Information Engineering Journal
FEA Information China Engineering Solutions

FEA Information Engineering Solutions:

A monthly publication in pdf format sent via e-mail, additionally archived on the website FEA Publications. www.feapublications.com

FEA Information China Engineering Solutions

The first edition was published February 2012. It is published in Simplified and Traditional Chinese in pdf format. Published : February, April, June, August, October, December. The China Solutions is archived on the website FEA Publications. www.feapublications.com
To sign up for the Traditional, or Simplified edition write to yanhua@feainformation.com

FEA Information Engineering Journal: ISSN #2167-1273, first published February, 2012

Available on www.feaiej.com

Platinum Participants

Participant Logo- Courtesy of Lancemore Co. Japan

BETA CAE Systems SA

CRAY

DatapointLabs

eta

esi

LANCEMORE Co.

GOMPUTE
A GRIDCORE COMPANY

JSOL

LSTC
Livermore Software Technology Corp.

Oasys
The Software House of Arup

KAIZENAT
Keep Improving

PENGUIN COMPUTING®

TERRABYTE Co.,Ltd.
Customer Satisfaction by Computer Solution & Computer Simulation

DFETECH

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Announcements

For participation, contact Anthony Giaccana agiac99@aol.com

LSTC November Classes - submitted by Aleta: classes@lstc.com

Confirmed to take place - space is still available

04-05	NVH & Freq. Domain Analysis	Y. Huang
10	Intro to LS-PrePost	Q. Yan
11-14	Intro to LS-DYNA	A. Tabiei

Penguin Computing at SC14 Booth 1931 – submitted by Catherine Pringle

Nov. 17-20

Visit Suri Bala of LSTC at the Penguin Computing Booth

Oct. Travel – submitted by Marsha Victory mv@feainformation.com

Visit with me at LS-DYNA&JSTAMP Forum

10/29-10/30 Hosted by: JSOL Corporation

ANA CROWNE PLAZA Hotel – Nagoya,

Cody and his favorite rider for shows.

Submitted by Marsha Victory

Tay is 9 years old - she has been riding Cody for 4 years in shows. By the amount of ribbons, it is safe to say that they have it out of testing simulation and ready for production.

Thanks to all the FEA Participants and the companies manufacturing safety helmets and sports safety gear - and the software that make simulation testing possible.

Sincerely, Marsha Victory - Trent Eggleston - Suri Bala
FEA Information Inc. USA edition

12th Annual UK Oasys LS-DYNA Users' Meeting

Location:

Arup Campus, Solihull, UK

The twelfth in a series of update meetings for Oasys LS-DYNA Users will be held at the Arup office in Solihull, UK, on **Thursday 22nd January 2014**.

As in previous years this event will bring together around 100 UK users of the Oasys and LS-DYNA software to provide information on upcoming features of Oasys and LS-DYNA, and to learn more about current and new applications, as well as other related software products.

We are looking forward to talks from the Oasys team at Arup as well as special guest speakers, details to be confirmed.

The event will be followed by a complimentary meal at The Boot Inn in Lapworth. Please note that The Boot Inn has a limited capacity so please ensure you register in advance to ensure your place at the evening meal.

Registration

This event is free of charge. To register for the event and the evening meal simply send an email with your company/affiliation and contact details to Alison Harper. Please also let us know if you have any particular dietary requirements when you register.

Please note: in line with our company sustainability policy we do not plan to provide printed copies of the presentations for each attendee at the event; the presentations will be made available to download after the event. If you particularly require a printed copy on the day please let us know when you register.

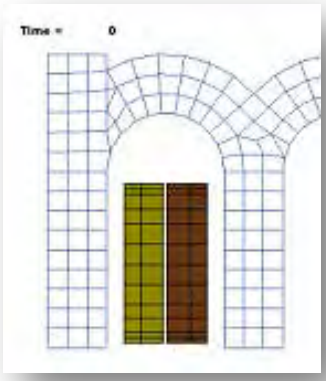
HP/High Performance Computing

Computer/Interconnect	**Processor**	#Nodes x #Processors per Node x #Cores Per Processor = Total #CPU	Time (Sec)	Benchmark Problem
HP ProLiant BL460c/Mellanox IB FDR	Intel Xeon E5-2697 v2 @ 2.7 GHz Turbo On	5 x 2 x 12 = 120	103	Neon refined revised
HP ProLiant BL460c/Mellanox IB FDR	Intel Xeon E5-2697 v2 @ 2.7 GHz Turbo On	4 x 2 x 12 = 96	118	Neon refined revised
HP ProLiant BL460c/Mellanox IB FDR	Intel Xeon E5-2697 v2 @ 2.7 GHz Turbo On	3 x 2 x 12 = 72	146	Neon refined revised
HP ProLiant BL460c/Mellanox IB FDR	Intel Xeon E5-2697 v2 @ 2.7 GHz Turbo On	2 x 2 x 12 = 48	197	Neon refined revised
HP ProLiant BL460c/Mellanox IB FDR	Intel Xeon E5-2697 v2 @ 2.7 GHz Turbo On	1 x 2 x 12 = 24	326	Neon refined revised

BULL/BULL

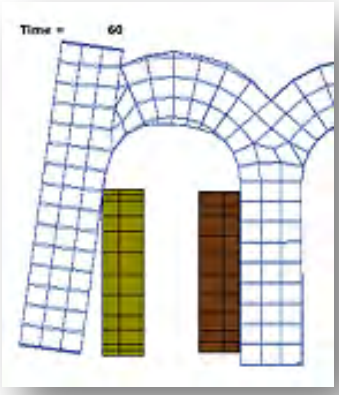
bullx blade system (B520)/Infiniband FDR	Intel® Xeon® E5-2690v3 @2.60GHz Turbo Enabled	16 x 2 x 12 = **384**	3207	car2car
bullx blade system (B520)/Infiniband FDR	Intel® Xeon® E5-2690v3 @2.60GHz Turbo Enabled	32 x 2 x 12 = **768**	2076	ar2car

www.dynaexamples.com/show-cases/joint-screw



Joint Screw

Example showing the use of a screw joint definition between rigid bodies. This option can be used to transfer a rotational into a translational motion. Download is available in the download section of this document.



Keywords

*BOUNDARY_PRESCRIBED_MOTION_RIGID_ID
*CONSTRAINED_JOINT_SCREW_ID
*CONTACT_AUTOMATIC_SINGLE_SURFACE_ID
*CONTROL_ACCURACY
*CONTROL_CONTACT
*CONTROL_ENERGY
*CONTROL_MPP_IO_NODUMP
*CONTROL_SHELL
*CONTROL_SOLID
*CONTROL_TERMINATION
*CONTROL_TIMESTEP
*DATABASE_JNTFORC
*DATABASE_RCFORC
*DATABASE_BINARY_D3PLOT
*DEFINE_CURVE
*ELEMENT_SOLID
*ELEMENT_SHELL
*END
*HOURGLASS
*KEYWORD_ID
*MAT_PIECEWISE_LINEAR_PLASTICITY
*MAT_RIGID
*NODE
*PART
*SECTION_SHELL
*SECTION_SOLID
*TITLE

d3VIEW® is a data-to-decision platform that helps LS-DYNA® Engineers and Scientists to extract, aggregate, organize, and analyze data to make better decisions quickly. d3VIEW helps to eliminate over 80% of time and effort while providing significant insight into the data using an array of rich interactive visualizations. Users can share and collaborate their insight, manage projects, tasks and media. d3VIEW® is HPC aware and can schedule, poll and manage its resource utilization.

News and Updates

Improved Install Package Manager: d3VIEW now comes bundled with an all inclusive package manager that can help install the software with minimal set up and configuration. The package manager is now available for CENTOS 5, CENTOS 6, RHEL 54, RHEL 63, SUSE 11.3 SP2, SUSE 11.3 SP3, MAC OS X.

Immediate release of next generation of visualization platform: Simlytiks® is a standalone visualization platform that can handle several rows of data and is powered by a wide range of rich interactive visualizations. The new version of Simlytiks® has been integrated with d3VIEW® for visualizing large amounts of data with capacity to view over 10,000 simulations or experiments with over 100+ dimensions. The visualizations have now been extended to include images, 3D data, and 40+ 2D visualizations.

Integration with Rescale® for on demand LS-DYNA Computing: LSTC offers users a very flexible and economical cloud pricing solution that allows LS-DYNA® engineers and scientists the opportunity to securely burst their simulations to the cloud whenever needed. Coupled with d3VIEW, customers can easily use an interface specifically designed to handle their LS-DYNA® jobs. Rescale provides a secure, cloud-based, high performance computing platform that allows engineers and scientists to run their compute-intensive simulations with improved performance and decreased runtime. With d3VIEW's powerful interface and Rescale's platform, users can securely scale simulations, archive important jobs, and easily collaborate with colleagues—all through their web browser. End-to-end data encryption, private isolated clusters, strict user authentication, and independent external security audits ensure that LS-DYNA® users' information is secure every step of the way.

www.dynasupport.com/howtos/implicit/elements-and-material-models-available-for-implicit

Elements and material models available for implicit

Availability of element and material formulations for LS-DYNA Implicit

The tangent stiffness matrix must be calculated for implicit materials. The tables below summarize the availability of material formulations in combination with element types. Since LSTC is constantly expanding implicit features a combination not listed below might be available already, you may check with your local support.

General remarks on implicit time integration

To run an implicit analysis in LS-DYNA,
you'll need at least a
*CONTROL_IMPLICIT_GENERAL
Command to flag the solution as implicit and to set the step size.

It is strongly recommended that the latest DOUBLE PRECISION executable be used.

LS-DYNA support site

At this site you will find answers to basic and advanced questions that might occur while using LS-DYNA. Furthermore it will provide information about new releases and ongoing developments. The content will be regularly updated with answers to frequent questions related to LS-DYNA. LS-DYNAsupport will not provide information on activities of your local LS-DYNA distributor as seminars, promotions, etc. We may ask to check the local sites for any kind of non-technical information.

Four New Solvers for Multiphysics Purposes

DES (Discrete Element Sphere)

A particle-based solver that implements the Discrete Element Method (DEM), a widely used technique for modeling processes involving large deformations, granular flow, mixing processes, storage and discharge in silos or transportation on belts. In LS-DYNA, each DE particle is a FEM node, making it easy to couple with other rigid or deformable structures by using penalty-based contact algorithms. The DE is highly parallelized and is capable of simulating systems containing over several hundred-million particles.

Here are some distinct features of the bond model:

1. The stiffness of the bond between particles is determined automatically from Young's modulus and Poisson's ratio.
2. The crack criteria are directly computed from the fracture energy release rate.
3. The behavior of bond particles is particle-size independent.

Incompressible CFD

The incompressible flow solver is based on state of the art finite element technology applied to fluid mechanics. It is fully coupled with the solid mechanics solver. This coupling permits robust FSI analysis via either an explicit technique when the FSI is weak, or using an implicit coupling when the FSI coupling is strong.

Electromagnetism

The solver calculates the Maxwell equations in the Eddy current (induction-diffusion) approximation. This is suitable for cases where the propagation of electromagnetic waves in the air (or vacuum) can be considered as instantaneous. Applications include magnetic metal forming, welding, and induced heating.

CESE/Compressible CFD

The CESE solver is a compressible flow solver based upon the Conservation Element/Solution Element (CE/SE) method, originally proposed by Dr. Chang in NASA Glenn Research Center. This method is a novel numerical framework for conservation laws.

www.beta-cae.gr/

Highlights on the site:

Recent white papers:

- Multivariant / Multidiscipline Modeling
- Modeling for Nastran Embedded Fatigue
- Results-based auto-refinement tool
- FORAN-ANSA/µETA: ship's normal modes
- ANSA KINETICS for Multi Body Dynamics

Solutions for:

- Process Automation
- Data Management
- Meshing
- Durability
- Crash & Safety
- NVH
- CFD
- Thermal analysis
- Optimization
- Powertrain
- Products made of composite materials
- Analysis Tools
- Maritime and Offshore Design
- Aerospace engineering
- Biomechanics

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City: São Caetano do Sul
State: São Paulo
Zip code: 09550-250

Software Distribution, Consulting, Training & Support

- LS-DYNA
- NX NASTRAN
- SOLID EDGE
- FEMAP
- midas NFX

http://sc14.supercomputing.org/

Monday, November 17, 2014 - Thursday, November 20, 2014
"HPC Matters" - Keynote speaker is physicist and best-selling author, Dr. Brian Greene.

FEA Information Particpants & SC Booth #

- Penguin 1931 w/Suri Bala, LST
- Cray Inc 2339
- Fujitsu Limited 3131
- Gompute 3451

Non Participant Guest Posting & SC Booth #

- Lenovo 1749
- Shanghai Supercomputer Center 558

HPC is helping to solve our hardest problems in the world. Innovations from our community have far reaching impact in every corner of science, all the way to investment banking, in the discovery of new drugs, to the precise prediction of the next superstorm. For more than two decades, the SC Conference has been the place to build and share the innovations that are making these life-changing discoveries possible.

In November of 2014, SC is going back to New Orleans with new ideas and a fresh take on HPC. Spotlighting the most original and fascinating scientific and technical applications from around the world, SC14 will once again bring together the HPC community – an unprecedented array of scientists, engineers, researchers, educators, students, programmers, system administrators, and developers – for an exceptional program of technical papers, tutorials, timely research posters, and Birds-of-a-Feather (BOF) sessions.

The SC14 Exhibition Hall will feature exhibits of the latest and greatest technologies from industry, academia and government research organizations; many of these technologies will be seen for the first time in New Orleans. Mark your calendar and make your way to New Orleans. No city offers the same extraordinary mix of food, music, culture, and history; and no conference offers a better opportunity to view the why HPC matters.

Join the community in November to share our collective accomplishments and to engage in important conversations of how we make HPC Matter to our lives, our future, our communities and our world.

http://www.cray.com/Products/BigData/Urika-XA.aspx

SC14 Booth Cray Inc 2339

Cray® Urika-XA™ Extreme Analytics Platform

Pre-integrated, open platform for high performance analytics delivers valuable business insights now and into the future

The flexible, multi-use Cray® Urika-XA™ data analytics platform addresses perhaps the most critical obstacle in data analytics today — limitation. Analytics problems are getting more varied and complex but the available solution technologies have significant constraints. Traditional analytics appliances lock you into a single approach and building a custom solution in-house is so difficult and time consuming that the business value derived from analytics fails to materialize.

In contrast, the Urika-XA platform is open, high performing and cost effective, serving a wide range of analytics tools with varying computing demands in a single environment. Pre-integrated with the Apache Hadoop® and Apache Spark™ frameworks, the Urika-XA system combines the benefits of a turnkey analytics appliance with a flexible, open platform that you can modify for future analytics workloads. This single-platform consolidation of workloads reduces your analytics footprint and total cost of ownership.

Based on pioneering work combining high-performance analytics and supercomputing technologies, the Urika-XA platform features next-generation capabilities. Optimized for compute-heavy, memory-centric analytics, it incorporates innovative use of memory-storage hierarchies and fast interconnects, which translates to excellent performance at scale on current as well as emerging analytics applications.

Additionally, the enterprise-ready Urika-XA platform eases the system management burden with a single point of support, standards-based software stack and compliance with enterprise standards so you can focus on extracting valuable business insights, not on managing your environment.

http://www.cray.com/Products/BigData/Urika-XA.aspx

Benefits of the Cray® Urika-XA™ Extreme Analytics Platform

- **Reduces total cost of ownership and footprint**: Single-platform consolidation of a wide range of analytic workloads, with support for both batch and latency-sensitive analytics
- **Designed for performance:** Optimized for compute- and memory-intensive emerging workloads, with acceleration through SSDs, fast interconnect and Cray Adaptive Runtime for Hadoop®
- **Provides a pre-integrated, open platform:** Ready to run big data analytics out of the box while supporting modification for future analytics applications
- **Ensures high manageability and interoperability**: Single pane of glass for systems management; standards-based software stack, storage system and datacenter options

Technology Highlights

Dense footprint

- 48 compute nodes in a single 42U rack
- High-performance Intel processors
- Capable of over 1,500 cores, 6 TB RAM per rack

Enhanced performance

- 38 TB SSD for high-speed storage
- High-performance, POSIX-compliant parallel file system
- InfiniBand
- Cray Adaptive Runtime for Hadoop

Pre-Installed software

- Apache Hadoop
- Apache Spark™
- Urika-XA Management System

For information contact lsdynacourses@aol.com

On-Line Composite Material Course
Structured for first time users
November 6-7, 2014
Register today
contact lsdynacourses@aol.com

Two 8-hour LS-DYNA Composite class and/or workshop options are available - $500 each:

- Class: the most important elements to start using all of the composite models in LS-DYNA.
- Workshop: Highly recommended to practice new knowledge, although an option.

Mechanics of Composite Materials

1. Lamina
2. Symmetric Laminate with in-plane loads
3. Symmetric Laminate with bending and twist loads
4. Symmetric Laminate with both in-plane and flexural loads
5. Un-symmetric Laminate
6. Strength and Failure

Shell Theories

Failure Theories

Lamination Theory and Transverse Shear

List of all LSDYNA Composite Materials

Modeling Delamination in LS-DYNA

Cohesive Elements

Flexible Loose Woven Fabric
(mat 234 and 235 developed by Tabiei)

Sandwich Composites

1. Through Thickness Integration
2. Sandwich Material Models

Composite Micro-Mechanics Models
(user-defined materials as examples)

1. Woven Composites
2. Strain Rate Effect
3. Fiber Reorientation

YouTube Tutorial by Al Tabiei

LS-DYNA Composite Fiber Direction
www.youtube.com/watch?v=4xuz0w9_gSc

LS-DYNA India Conference & Training LS-DYNA India

Submitted by Ramesh - For any queries/details please contact us - support@kaizenat.com

Kaizenat Technologies Pvt. Ltd is pleased to invite you & your team and announce

- LS-DYNA User's Conference.
- Featuring for the first time in India, LS-DNA conference is followed by Training .
- Held in Bangalore on November 3rd and 4th, 2014 at Hotel Aloft
- Held in Pune on November 6th & 7th, 2014 at Hotel Le Meridien.
- Scientists/Developers from LSTC will be presenting during the proceedings

	DAY 1 - BANGALORE	DAY 1 - PUNE
09:00 - 09:30	Registration	
09:30 - 09:45	**Welcome Address** Ramesh Venkatesan, Director, Kaizenat Technologies Pvt. Ltd.	
09:45 - 10:15	**Keynote Speach**	
10:15 - 11:15	**LS-DYNA Structural - New Developments** Suri Bala, Sr. Scientist, LSTC	
11:15 - 11:30	Tea Break	
11:30 - 12:30	**LS-DYNA New Fluid Solver Developments** Inaki Caldichoury, Scientist, LSTC	
12:30 - 13:00	**Design Optimization of a Lightweight Automotive Crash Energy Management Solution using LS-DYNA & LS-OPT** Subhransu Mohapatra & Krishna Kishore SABIC Research & Tech Center Pvt. Ltd.	**CAE based Certification using LS DYNA** Rahul Mahajan, ARAI
13:00 - 14:00	**Lunch**	
14:00 - 14:30	**d3VIEW** Suri Bala, Sr.Scientist, LSTC	
14:30 - 15:00	**Tuning of vent and porosity paramters of airbag for linear impact correlation using LS-DYNA & LS-OPT** Aravind, Balaji & Shivakumar, Autoliv India Pvt Ltd.	**Side impact injury prediction using LS DYNA** Kedar Joshi, TATA Motors Ltd.
15:00 - 15:30	**Modeling of a moving skip having discrete material by combining DEM and MBD using LS DYNA** Kathiresan Ganesan, FLSmidth Ltd.	**Designing blast doors of explosive storage using LS DYNA** Vipul Mehta RD Konsultant Pvt Ltd.

15:30 - 15:45	**Tea Break**	
15:45 - 16:30	**LS-OPT - New** Suri Bala, Sr. Scientist, LSTC	
16:30 - 17:00	**Acoustic Performance Evaluation of a Thermoplastic Composite Wheel using LS-DYNA,** Subhransu Mohapatra SABIC Research & Tech. Center Pvt. Ltd.	**Fuel tank simulation against FMVSS 301 regulatory requirements** Somnath Sawant & Daniel Esaw, Mahindra Engineering Services Ltd.
17:00 - 17:30	**Dynamic Loads in the Fan Containment Structure of a Turbofan Engine**, Sunil K Sinha & Sreekanth Dorbala, GE India Tech Centre	**Drawing of fuel tank and sprinback analysis of wheel arch using LS DYNA,** Bhaskar, Praveen & Ashlesha Jyoti Technical Services Pvt. Ltd.
17:30 - 17:45	**Feedback on papers - LSTC panel**	
17:45 - 18:00	**Vote of Thanks** Ramesh Venkatesan, Director, Kaizenat Technologies Pvt. Ltd.	
	DAY 2 - BANGALORE & PUNE	
09:00 - 09:30	**Registration**	
09:30 - 11:15	**'Damage Modelling & Contact Mechanics Training'** Suri Bala, Sr. Scientist, LSTC	**CFD & Electro Magnetics Training** Inaki Caldichoury, Scientist, LSTC
11:15 - 11:30	Tea Break	
11:30 - 13:00	**'Damage Modelling & Contact Mechanics Training'** Suri Bala, Sr. Scientist, LSTC	**CFD & Electro Magnetics Training** Inaki Caldichoury, Scientist, LSTC
13:00 - 14:00	**Lunch**	
14:00 - 15:30	**Optimization Training** Suri Bala, Sr. Scientist, LSTC	
15:30 - 15:45	Tea Break	
15:45 - 17:15	**Optimization Training** Suri Bala, Sr. Scientist, LSTC	
17:15 - 17:30	**Vote of Thanks** Ramesh Venkatesan, Director, Kaizenat Technologies Pvt Ltd	

EXCERPT Full Article at:
www.esi-group.com/company/about/customer-successes/sl-rasch-collaborates-esi-achieve-architectural-excellence-mecca-and-medina

SL RASCH collaborates with ESI to achieve architectural excellence in Mecca and Medina

"With the know-how of ESI experts and the capabilities built into ESI's advanced CAE software solutions, designing our innovative structural systems became possible". Dr. Mahmoud Bodo Rasch, Founder and owner of SL RASCH GmbH Special and Lightweight Structures.

Challenge: Architecture firm SL RASCH took on the complex project of designing and constructing the highly innovative Medina Haram Piazza. The flexible shading umbrellas and the huge elastic wing-like clock hands on the top of the Mecca Royal Hotel Clock Tower presented very specific challenges. With the objective of creating wind- resistant designs, SL RASCH conducted initial studies using wind tunnel tests on reduced scale rigid models. However, these models could not predict the flexible behavior of the structures under wind load. In order to address their design challenges, the team turned to ESI and their simulation solutions.

Benefits: Using simulation, SL RASCH was able to confidently investigate the effect of wind load on the umbrellas and clock tower for the first time. The studies helped SL RASCH make solid decisions on how to construct these two massive structures.

Story: SL RASCH & ESI: The ollaboration: Today the millions of pilgrims that travel every year to the Great Mosque of Medina in Saudi Arabia are sheltered by more than 250 foldable 26x26m hydraulically hinged arm umbrellas (Fig. 1).

Fig. 1 Umbrellas at the Mosque of Medina

These translucent umbrellas fold away at night and open up during the day to create a microclimate beneath them that is up to 8°C cooler than the surrounding area. They also add materially to the beauty of the Piazza. The Mecca Royal Hotel Clock Tower (Fig 2.) is another significant site for pilgrims travelling to Saudi Arabia. This complex is located just a few steps away from the Grand Mosque and in 2012 the tower became the second tallest building in the world. The complex serves the pilgrims and is a fine example of modern architecture in the city of Mecca. SL RASCH, a German based company, specializes in buildings and lightweight structures, integrating architecture and engineering. SL RASCH began working on both of these projects for Mecca in 2005.

Fig 2; the Mecca Royal Hotel also known as "Abraj Al-Bait Towers"

In order to test their projects, SL RASCH initially used reduced scale physical models. However, this process had room for improvement. As a result, Dr. Rasch, CEO of SL RASCH, and his longtime friend Dr. Eberhard Haug, co-Founder of ESI Group and author of the lightweight structure analysis code LISA, began collaborating to apply simulation methods in elaborating the design of these structures. Dr. Haug's knowledge in flexible structures along with ESI's numerical simulation solutions helped SL RASCH in designing, testing and installing all the umbrellas at the site of The Great Mosque of Medina. Simulation also provided insightful flow flow analysis for the uppermost part of the Mecca Royal Hotel Clock Tower.

Simulation of Lightweight Structures: SL RASCH and ESI combined their knowledge and best simulation technologies to achieve the desired results. SL RASCH virtually built and tested different types of minimal energy lightweight structures for this architectural project by relying on Virtual Performance Solution (VPS), ESI's software to assess all domains of product performance. SL RASCH used tailor-made modules developed by both companies to model naturally turbulent wind loads and optimize the shape and structure of the umbrellas. To achieve that objective the fabric of the umbrellas was represented by optimal minimum energy flexible membranes, which are physically analogous to self-forming iso-tension soap films. For structural analysis of turbulent wind load on such lightweight structures, the team used Fluid-Structure Interaction (FSI) simulations, coupling Computational Fluid Dynamics (CFD) and Computational Structural Dynamics (CSD).

FOR THE FULL GRAPHICS AND COMPETE SUCCESS STORY

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Training Classes

Space Available

classes@lstc.com

Training Class	Location	Dates	
NVH	CA	Nov 4-5	Confirmed to take place Space Available
Intro to LS-PrePost	CA	Nov 10	Confirmed to take place Space Available
Intro to LS-DYNA	CA	Nov 11-14	Confirmed to take place Space Available
Adv Impact & Options	MI	Dec 11-12	
Intro to LS-PrePost	MI	December 15	
Intro to LS-DYNA	MI	Dec 16-19	

BETA CAE Systems S.A. www.beta-cae.gr

BETA CAE Systems S.A.– ANSA

Is an advanced multidisciplinary CAE pre-processing tool that provides all the necessary functionality for full-model build up, from CAD data to ready-to-run solver input file, in a single integrated environment. ANSA is a full product modeler for LS-DYNA, with integrated Data Management and Process Automation. ANSA can also be directly coupled with LS-OPT of LSTC to provide an integrated solution in the field of optimization.

BETA CAE Systems S.A.– μETA

Is a multi-purpose post-processor meeting diverging needs from various CAE disciplines. It owes its success to its impressive performance, innovative features and capabilities of interaction between animations, plots, videos, reports and other objects. It offers extensive support and handling of LS-DYNA 2D and 3D results, including those compressed with SCAI's FEMZIP software

CRAY www.cray.com

Cray CS300-AC Cluster Supercomputer

§ The Cray CS300-AC cluster supercomputer features an air-cooled architecture based on blade server or rackmount server building block platforms. The system is built for capacity and data-intensive workloads. It delivers turnkey high performance computing with a broad range of flexible system configuration options.

§ The CS300-AC system features two new preconfigured ready-to-go solutions, the CS300 shared memory parallel and the CS300 large memory systems.

Cray CS300-LC Cluster Supercomputer

§ The Cray CS300-LC cluster solution features a direct liquid-cooled architecture using warm water heat exchangers instead of chillers. It delivers a turnkey, energy-efficient solution that reduces datacenter power and cooling operation costs for faster ROI while addressing capacity and data-intensive workloads.

Cray XC30 Supercomputer Series

§ The Cray XC30 family delivers on Cray's commitment to an adaptive supercomputing architecture that provides both extreme scalability and sustained performance. The flexibility of the Cray XC30 platform ensures that users can configure the exact machine to meet their specific requirements today, and also remain confident they can upgrade and enhance their system to address the demands of the future.

Cray Sonexion Scale-out Lustre Storage System

§ Brought to you by Cray, the world's leading experts in parallel storage solutions for HPC and the technical enterprise, the Cray Sonexion is a fully integrated, modular and compact scale-out storage system for Lustre.

DatapointLabs **www.datapointlabs.com**

Testing over 1000 materials per year for a wide range of physical properties, DatapointLabs is a center of excellence providing global support to industries engaged in new product development and R&D.

The company meets the material property needs of CAE/FEA analysts, with a specialized product line, TestPaks®, which allow CAE analysts to easily order material testing for the calibration of over 100 different material models.

DatapointLabs maintains a world-class testing facility with expertise in physical properties of plastics, rubber, food, ceramics, and metals.

Core competencies include mechanical, thermal and flow properties of materials with a focus on precision properties for use in product development and R&D.

Engineering Design Data including material model calibrations for CAE Research Support Services, your personal expert testing laboratory Lab Facilities gives you a glimpse of our extensive test facilities Test Catalog gets you instant quotes for over 200 physical properties.

ETA – Engineering Technology Associates **www.eta.com**

etainfo@eta.com

Inventium Suite™

Inventium Suite™ is an enterprise-level CAE software solution, enabling concept to product. Inventium's first set of tools will be released soon, in the form of an advanced Pre & Post processor, called PreSys.

Inventium's unified and streamlined product architecture will provide users access to all of the suite's software tools. By design, its products will offer a high performance modeling and post-processing system, while providing a robust path for the integration of new tools and third party applications.

PreSys

Inventium's core FE modeling toolset. It is the successor to ETA's VPG/PrePost and FEMB products. PreSys offers an easy to use interface, with drop-down menus and toolbars, increased graphics speed and detailed graphics capabilities. These types of capabilities are combined with powerful, robust and accurate modeling functions.

VPG

Advanced systems analysis package. VPG delivers a unique set of tools which allow engineers to create and visualize, through its modules--structure, safety, drop test, and blast analyses.

DYNAFORM

Complete Die System Simulation Solution. The most accurate die analysis solution available today. Its formability simulation creates a "virtual tryout", predicting forming problems such as cracking, wrinkling, thinning and spring-back before any physical tooling is produced

ESI Group www.esi-group.com

Visual-Environment: Visual-Environment is an integrated suite of solutions which operate either concurrently or standalone within a common environment. It aims at delivering an open collaborative engineering framework. As such, it is constantly evolving to address various disciplines and available solvers.

Visual-Crash is a dedicated environment for crash simulation: It helps engineers get their job done in the smoothest and fastest possible way by offering an intuitive windows-based graphical interface with customizable toolbars and complete session support.

For LS-DYNA users, Visual-Crash DYNA allows to focus and rely on high quality digital models, from start to finish as it addresses the coupling with competitive finite element or rigid body based software. This very open and versatile environment simplifies the work of CAE engineers across the enterprise by facilitating collaboration and data sharing.

Further tools are integrated in Visual-Environment enhancing CAE engineers work tasks most efficiently.

Visual-Mesh generates 1D, 2D and 3D elements for any kind of simulation.
Visual-Mesh provides automatic and guided surfaces clean up, application specific mesh generation and intuitive post mesh editing features..

Visual-Viewer is a complete, productive and innovative post-processing environment for CAE applications.

Visual-Viewer delivers a dedicated plotting and animation control solution. It offers a multi page, multi plot environment, allowing to group data into pages and plots. It is designed with a Windows GUI based on an intuitive and sleek user interface.

Visual-Process Executive is an advanced CAE environment for process customization and automation.

VisualDSS is an End-to-End Decision Support System for CAE. Manufacturers widely resort to Simulation-Based Design to gain a competitive edge in product development.

Gompute on demand®/ Gridcore AB Sweden
www.gompute.com www.gridcore.se

Gompute is owned, developed and operated by Gridcore AB in Sweden. Founded in 2002, Gridcore is active in three areas: Systems Integration, Research & Development and HPC as a service.

Gridcore has wide experience of different industries and applications, developed a stable product portfolio to simplify an engineer/scientist's use of computers, and has established a large network of partners and collaborations, where we together solve the most demanding computing tasks for our customers. Gridcore has offices in Gothenburg (Sweden), Stuttgart (Germany), Durham NC (USA) and sales operations in The Netherlands and Norway.

The Gridcore developed E-Gompute software for internal HPC resources gives end users (the engineers) an easy-to-use and complete environment when using HPC resources in their daily work, and enables collaboration, advanced application integrations, remote pre/post, accounting/billing of multiple teams, license tracking, and more, accelerating our customers usage of virtual prototyping

.

JSOL Corporation www.jsol.co.jp/english/cae/

HYCRASH

Easy-to-use one step solver, for Stamping-Crash Coupled Analysis. HYCRASH only requires the panels' geometry to calculate manufacturing process effect, geometry of die are not necessary. Additionally, as this is target to usage of crash/strength analysis, even forming analysis data is not needed. If only crash/strength analysis data exists and panel ids is defined. HYCRASH extract panels to calculate it's strain, thickness, and map them to the original data.

JSTAMP/NV

As an integrated press forming simulation system for virtual tool shop the JSTAMP/NV meets the various industrial needs from the areas of automobile, electronics, iron and steel, etc. The JSTAMP/NV gives satisfaction to engineers, reliability to products, and robustness to tool shop via the advanced technology of the JSOL Corporation.

JMAG

JMAG uses the latest techniques to accurately model complex geometries, material properties, and thermal and structural phenomena associated with electromagnetic fields. With its excellent analysis capabilities, JMAG assists your manufacturing process

Livermore Software Technology Corp. www.lstc.com

LS-DYNA

A general-purpose finite element program capable of simulating complex real world problems. It is used by the automobile, aerospace, construction, military, manufacturing, and bioengineering industries. LS-DYNA is optimized for shared and distributed memory Unix, Linux, and Windows based, platforms, and it is fully QA'd by LSTC. The code's origins lie in highly nonlinear, transient dynamic finite element analysis using explicit time integration.

LS-PrePost

An advanced pre and post-processor that is delivered free with LS-DYNA. The user interface is designed to be both efficient and intuitive. LS-PrePost runs on Windows, Linux, and Macs utilizing OpenGL graphics to achieve fast rendering and XY plotting.

LS-OPT

LS-OPT is a standalone Design Optimization and Probabilistic Analysis package with an interface to LS-DYNA.

The graphical preprocessor LS-OPTui facilitates definition of the design input and the creation of a command file while the postprocessor provides output such as approximation accuracy, optimization convergence, tradeoff curves, anthill plots and the relative importance of design variables.

LS-TaSC

A Topology and Shape Computation tool. Developed for engineering analysts who need to optimize structures, LS-TaSC works with both the implicit and explicit solvers of LS-DYNA. LS-TaSC handles topology optimization of large non-linear problems, involving dynamic loads and contact conditions.

LSTC Dummy Models

Anthropomorphic Test Devices (ATDs), as known as "crash test dummies", are life-size mannequins equipped with sensors that measure forces, moments, displacements, and accelerations.

LSTC Barrier Models

LSTC offers several Offset Deformable Barrier (ODB) and Movable Deformable Barrier (MDB) model.

Oasys, Ltd **www.oasys-software.com/dyna**

Oasys LS-DYNA® Environment

The Oasys Suite of software, exclusively written for LS-DYNA®, is at the leading edge of the market and is used worldwide by many of the largest LS-DYNA® customers.

Oasys PRIMER is a model preparation tool that is fully compatible with the latest version of LS-DYNA®, eliminating the risk of data loss or corruption when a file is manipulated, no matter what operations are performed on it:

Key benefits:

- Maintains data integrity
- Finds and fixes model errors (currently over 5000 checks)
- Specialist tools for dummy positioning, seatbelt fitting, mechanisms, interior head impact etc.
- Connection manager for spotwelds, bolts, adhesive etc.
- Intelligent editing, deletion and merging of data
- Customisable with macros and JavaScript.

Oasys D3PLOT is a powerful 3D visualization package for post-processing LS-DYNA® analyses

Key benefits:

- Fast, high quality graphics
- Easy, in-depth access to all LS-DYNA® results.
- User defined data components
- Customisable with JavaScript.

Oasys T/HIS is an X-Y graph plotting package for LS-DYNA®

Key benefits:

1. Automatically reads all LS-DYNA® results.
2. Wide range of functions and injury criteria.
3. Easy handling of data from multiple models
4. Scriptable for automatic post-processing

Oasys REPORTER is an automatic report generation tool, for use with LS-DYNA®. which allows fast automatic report creation for analyses.

Shanghai Hengstar www.hengstar.com

Center of Excellence

Hengstar Technology is the first LS-DYNA training center of excellence in China. As part of its expanding commitment to helping CAE Engineers, Hengstar Technology will continue to organize high level training courses and seminars in 2012.

The lectures/training are taught by senior engineers and experts mainly from LSTC, Carhs, OEMs, and other consulting groups.

On Site Training

Hengstar also provides customer customized training programs on-site at the company facility.

Training is tailored for company needs using LS-DYNA or the additional software products by LSTC.

Distribution & Support

Hengstar Distributes and supports LS-DYNA, LS-OPT, LS-PrePost, LS-TaSC. Hongsheng Lu, previously was directly employed by LSTC before opening his distributorship in China for LSTC software.

Hongsheng travels to LSTC often to keep current on the latest software features and support to continue to grow Hengstar as a CAE consulting group.

Comet Solutions www.cometsolutions.com

Comet enables rapid and robust design space exploration from concept discovery and selection through concept validation using a model-based engineering approach. We empower our customers to discover an array of possible design concepts, evaluate which ones are feasible, then select the best.

Comet software is a tool-open, extensible, vendor-neutral performance engineering workspace that lets engineers and engineering project teams readily carry out multi-fidelity, multi-physics modeling and simulation.

In the Comet workspace, companies can better leverage all of their simulation assets – "best practices" expertise, COTS as well as in-house engineering tools, and product performance data.

Canada	**Metal Forming Analysis Corp MFAC** galb@mfac.com www.mfac.com			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	eta/VPG	
	eta/DYNAFORM	INVENTIUM/PreSys		
United States	**CAE Associates Inc.** info@caeai.com www.caeai.com			
	ANSYS Products	CivilFem	Consulting ANSYS Consulting LS-DYNA	
United States	**DYNAMAX** sales@dynamax-inc.com www.dynamax-inc.com			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models		LSTC Barrier Models	

United States	**ESI-Group N.A** www.esi-group.com			
	QuikCAST	SYSWELD	PAM-RTM	PAM-CEM
	VA One	CFD-ACE+	ProCAST	Visual-Process
	VisualDSS	Weld Planner	Visual-Environment	IC.IDO
United States	**Engineering Technology Associates – ETA** www.eta.com		etainfo@eta.com	
	INVENTIUM/PreSy	NISA	VPG	LS-DYNA
	LS-OPT	DYNAform		
United States	**Gompute** www.gompute.com		info@gompute.com	
	LS-DYNA Cloud Service		Additional software	
	Additional Services			
United States	**Comet Solutions** Comet Software		steve.brown@cometsolutions.com	

United States	**Livermore Software Technology Corp**		sales@lstc.com	
	LSTC www.lstc.com			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	TOYOTA THUMS	

United States	**Predictive Engineering** www.predictiveengineering.com		george.laird@predictiveengineering.com	
	FEMAP	NX Nastran	LS-DYNA	LS-OPT
	LS-PrePost	LS-TaSC	LSTC Dummy Models	
			LSTC Barrier Models	

France	**DynaS+**		v.lapoujade@dynasplus.com	
	www.dynasplus.com		Oasys Suite	
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	DYNAFORM	VPG	MEDINA	
	LSTC Dummy Models		LSTC Barrier Models	

Germany	**CADFEM GmbH**		lsdyna@cadfem.de
	www.cadfem.de		
	ANSYS	LS-DYNA	optiSLang
	ESAComp	AnyBody	
	FTI FormingSuite		

Germany	**DYNAmore GmbH**		uli.franz@dynamore.de	
	www.dynamore.de			
	PRIMER	LS-DYNA	FTSS	VisualDoc
	LS-OPT	LS-PrePost	LS-TaSC	DYNAFORM
	Primer	FEMZIP	GENESIS	Oasys Suite
	TOYOTA THUMS		LSTC Dummy & Barrier Models	

The Netherlands	**Infinite Simulation Systems B.V**		j.mathijssen@infinite.nl	
	www.infinite.nl			
	ANSYS Products	CivilFem	CFX	Fluent
	LS-DYNA	LS-PrePost	LS-OPT	LS-TaSC

Italy	**EnginSoft SpA**		info@enginsoft.it	
	www.enginsoft.it			
	ANSYS	MAGMA	Flowmaster	FORGE
	CADfix	LS-DYNA	Dynaform	Sculptor
	ESAComp	AnyBody	FTI Software	
	AdvantEdge	Straus7	LMS Virtual.Lab	ModeFRONTIER
Russia	**STRELA**		info@dynarussia.com	
	LS-DYNA	LS-TaSC	LS-OPT	LS-PrePost
	LSTC Dummy Models		LSTC Barrier Models	
Sweden	**DYNAmore Nordic**		marcus.redhe@dynamore.se	
	www.dynamore.se		Oasys Suite	
	ANSA	µETA	LS-DYNA	LS-OPT
	LS-PrePost	LS-TaSC	FastFORM	DYNAform
	FormingSuite		LSTC Dummy Models	
			LSTC Barrier Models	
Sweden	**GOMPUTE**		info@gridcore.com	
	www.gridcore.se		www.gompute.com	
	LS-DYNA Cloud Service		Additional software	

Switzerland	**DYNAmoreSwiss GmbH**		info@dynamore.ch	
	www.dynamore.ch			
	LS-DYNA		LS-OPT	LS-PrePost
	LS-TaSC		LSTC Dummy Models	
			LSTC Barrier Models	

UK	**Ove Arup & Partners**		dyna.sales@arup.com	
	www.oasys-software.com/dyna		TOYOTA THUMS	
	LS-DYNA		LS-OPT	LS-PrePost
	LS-TaSC	PRIMER	D3PLOT	T/HIS
	REPORTER	SHELL	FEMZIP	HYCRASH
	DIGIMAT	Simpleware	LSTC Dummy Models	
			LSTC Barrier Models	

Australia	**LEAP**			
	www.leapaust.com.au			
	ANSYS Mechanical	ANSYS CFD	ANSYS EKM	Recurdyn
	ANSYS DesignXplorer	ANSYS HPC	FlowMaster	Ensigh
	LS DYNA	DYNAform	Moldex 3D	FE-Safe
China	**ETA – China**		lma@eta.com.cn	
	www.eta.com/cn			
	Inventium	VPG	DYNAFORM	NISA
	LS-DYNA	LS-OPT	LSTC Dummy Models	LS-PrePost
			LSTC Barrier Models	LS-TaSC
China	**Oasys Ltd. China**		Stephen.zhao@arup.com	
	www.oasys-software.com/dyna			
	PRIMER D3PLOT	HYCRASH	T/HIS REPORTER	SHELL
	LS-DYNA	LS-OPT	LSTC Dummy Models	LS-PrePost
	DIGIMAT	FEMZIP	LSTC Barrier Models	LS-TaSC
China	**Shanghai Hengstar Technology**		info@hengstar.com	
	www.hengstar.com			
	LS-DYNA	LS-TaSC	LSTC Barrier Models	
	LS-DYNA Courses	LS-OPT	LSTC Dummy Models	LS-PrePost

India	**Oasys Ltd. India**		lavendra.singh@arup.com	
	www.oasys-software.com/dyna			
	PRIMER	D3PLOT	T/HIS	
			LS-OPT	LSTC Dummy Models
			LS-DYNA	LSTC Barrier Models
				LS-PrePost
				LS-TaSC

India	**CADFEM Eng. Svce**		info@cadfem.in	
	www.cadfem.in			
	ANSYS	VPS	ESAComp	optiSLang
	LS-DYNA	LS-OPT	LS-PrePost	

India	**Kaizenat Technologies Pvt. Ltd**		support@kaizenat.com	
	http://kaizenat.com /			
	LS-DYNA	LS-OPT	LSTC Dummy Models	LS-PrePost
	Complete LS-DYNA suite of products		LSTC Barrier Models	LS-TaSC

Distribution & Consulting	Asia Pacific	Distribution & Consulting

Japan	**CTC**	LS-dyna@ctc-g.co.jp		
	www.engineering-eye.com			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	CmWAVE	
Japan	**JSOL**			
	www.jsol.co.jp/english/cae		Oasys Suite	
	JSTAMP	HYCRASH	JMAG	
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	TOYOTA THUMS	
Japan	**FUJITSU**			
	http://jp.fujitsu.com/solutions/hpc/app/lsdyna			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	CLOUD Services	
Japan	**LANCEMORE**	info@lancemore.jp		
	www.lancemore.jp/index_en.html			
	Consulting			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models		
Japan	**Terrabyte**	**English:**		
	www.terrabyte.co.jp	www.terrabyte.co.jp/english/index.htm		
	Consulting			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	AnyBody	

Korea	**THEME**	wschung@kornet.com		
	www.lsdyna.co.kr		Oasys Suite	
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	eta/VPG	Planets
	eta/DYNAFORM	FormingSuite	Simblow	TrueGRID
	JSTAMP/NV	Scan IP	Scan FE	Scan CAD
	FEMZIP			

Korea	**KOSTECH**	young@kostech.co.kr		
	www.kostech.co.kr			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	eta/VPG	FCM
	eta/DYNAFORM	DIGIMAT	Simuform	Simpack
	AxStream	TrueGrid	FEMZIP	

Taiwan	**Flotrend**	gary@flotrend.tw		
	www.flotrend.com.tw			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	eta/VPG	FCM

Taiwan	**APIC**			
	www.apic.com.tw			
	LS-DYNA	LS-OPT	LS-PrePost	LS-TaSC
	LSTC Dummy Models	LSTC Barrier Models	eta/VPG	FCM

Gompute

www.gompute.com

Penguin Computing

www.penguincomputing.com/services/hpc-cloud

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Run your LS-DYNA simulations and pay for what you use on a turn-key environment

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- Run your simulations from 0.05 €/CCH without reservation
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For more information please visit: www.gompute.com

Price for computing-core/hour (CCH). Licenses and account set up are not included. Pricing valid only for universities, academic centers and research institutes. The following are trademarks or registered trademarks of Livermore Software Technology Corporation in the United States and/or other countries: LS-DYNA, LS-OPT, LS-PrePost, LS-TaSC. Gompute is owned and operated by Gridcore AB, 2012 All rights reserved.

POD (Penguin Computing on Demand) offers software including LSTC's LS-DYNA

www.penguincomputing.com/services/hpc-cloud

Penguin HPC clusters are optimized for engineering workloads and offer:

- Instant access to an HPC Cloud Cluster
- High performance InfiniBand bare-metal compute
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- No charges for network transfers
- Cost-effective, pay-per-use billing model
- Secure environment for private data
- Detailed billing reports for user groups and projects

Self Registration Portal – featuring rich--documentation, wiki, FAQ, pricing and more.

https://pod.penguincomputing.com/

POD Software Applications and Libraries (visit site for complete listing)

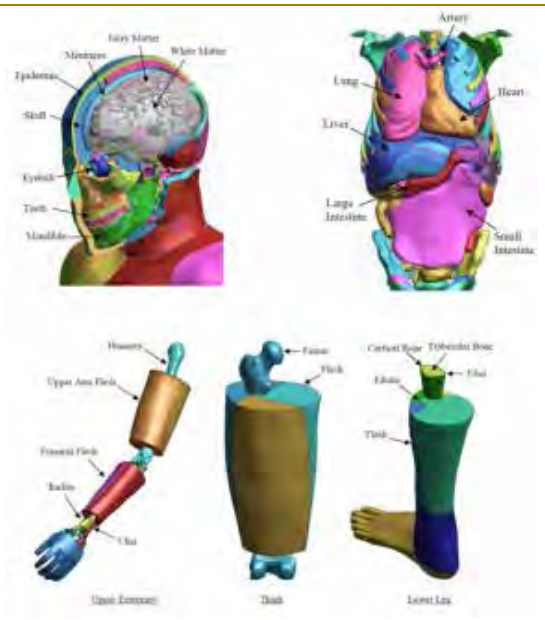
FEA, CFD and FDTD Modeling

- **LS-DYNA** / LS-PrePost LS-DYNA is an advanced general-purpose multiphysics simulation software package. Its core-competency lie in highly nonlinear transient dynamic finite element analysis (FEA) using explicit time integration. LS-PrePost is an advanced pre and post-processor that is delivered free with LS-DYNA.
- **OpenFoam:** OpenFOAM (Open source Field Operation And Manipulation) is a C++ toolbox for the development of customized numerical solvers, and pre-/post-processing utilities for the solution of continuum mechanics problems, including computational fluid dynamics (CFD).
- **ANSYS HFSS:** ANSYS HFSS software is the industry standard for simulating 3-D full-wave electromagnetic fields. Its gold-standard accuracy, advanced solver and compute technology have made it an essential tool for engineers designing high-frequency and high-speed electronic components.
- **ANSYS Fluent** ANSYS Fluent software contains the broad physical modeling capabilities needed to model flow, turbulence, heat transfer, and reactions for industrial applications.
- **Star-CD** and **Star-CCM+:** STAR-CCM+ is CD-adapco´s newest CFD software product. It uses the well established CFD solver technologies available in STAR-CD, and it employs a new client-server architecture and object oriented user interface to provide a highly integrated and powerful CFD analysis environment to users.
- **Convergent:** CONVERGE is a Computational Fluid Dynamics (CFD) code that completely eliminates the user time needed to generate a mesh through an innovative run-time mesh generation technique.
- **Lumerical:** Simulation tools that implement FDTD algorithms.

Total Human Model for Safety - THUMS
LSTC is the US distributor for THUMS

About

The Total Human Model for Safety, or THUMS®, is a joint development of Toyota Motor Corporation and Toyota Central R&D Labs. Unlike dummy models, which are simplified representation of humans, THUMS represents actual humans in detail, including the outer shape, but also bones, muscles, ligaments, tendons, and internal organs. Therefore, THUMS can be used in automotive crash simulations to identify safety problems and find their solutions.

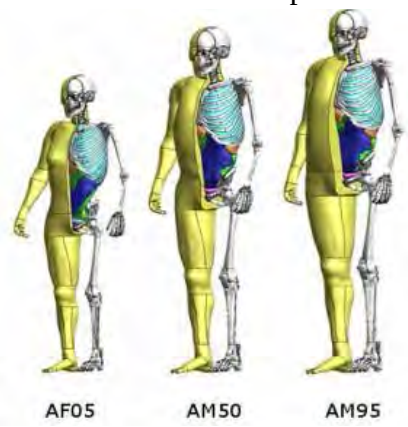


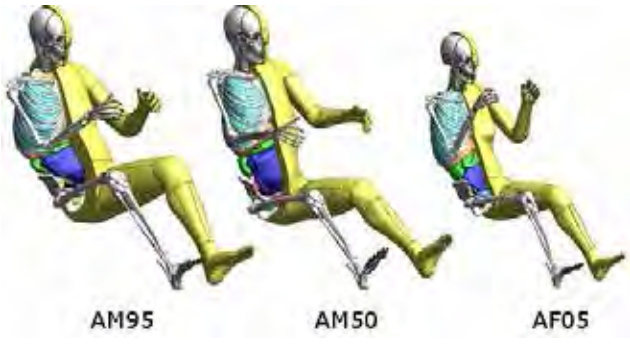
THUMS is limited to civilian use and may under no circumstances be used in military applications.

Model Details: Each of the different sized models is available as sitting model to represent vehicle occupants and as standing model to represent pedestrians.

The internal organs were modeled based on high resolution CT-scans.

LSTC is the US distributor for THUMS. Commercial and academic licenses are available.
For more information please contact us at THUMS@lstc.com .





THUMS®, is a registered trademark of Toyota Central R&D Labs.

Germany	**CADFEM GmbH**	www.cadfem.de
Germany	**DYNAmore**	www.dynamore.de/en
US	**LSTC**	www.lstc.com
US	**ETA**	www.eta.com
US	**Cae Associates**	www.caeai.com
Sweden	**DYNAMORE Nordic**	www.dynamore.se
France	**DynAS+**	www.dynasplus.com
Thailand	**DFE-Tech**	www.dfe-tech.com/training.html
UK	**ARUP**	www.oasys-software.com/dyna/en/training

www.defense-aerospace.com/articles-view/release/3/157979/first-luftwaffe-a400m-makes-first-flight.html

First German Air Force A400M Makes Its Maiden Flight

SEVILLE, Spain --- The first Airbus A400M new-generation airlifter ordered by the German Air Force has made its maiden flight, marking a key milestone towards its delivery.

The aircraft, known as MSN18, took off from Seville, Spain today at 14:30 local time (GMT+1) and landed back on site 4 hours and 58 minutes later.

Experimental Test Pilot Thomas Wilhelm, who captained the flight, said after landing: "It is a great privilege to have conducted the first flight of the German Air Force's first A400M.

"I am absolutely confident that the combination of strategic range with true tactical capability that it brings will contribute enormously to the service's air mobility capability for military and humanitarian missions."

The aircraft is the first of 53 ordered by the German Air Force and will be known in-service as the A400M Atlas.

www.nasa.gov/press/2014/october/nasa-s-hubble-telescope-finds-potential-kuiper-belt-targets-for-new-horizons/#.VD7nJBZOjfU

NASA's Hubble Telescope Finds Potential Kuiper Belt Targets for New Horizons Pluto Mission

Peering out to the dim, outer reaches of our solar system, NASA's Hubble Space Telescope has uncovered three Kuiper Belt objects (KBOs) the agency's New Horizons spacecraft could potentially visit after it flies by Pluto in July 2015.

The KBOs were detected through a dedicated Hubble observing program by a New Horizons search team that was awarded telescope time for this purpose.

"This has been a very challenging search and it's great that in the end Hubble could accomplish a detection – one NASA mission helping another," said Alan Stern of the Southwest Research Institute (SwRI) in Boulder, Colorado, principal investigator of the New Horizons mission.

The Kuiper Belt is a vast rim of primordial debris encircling our solar system. KBOs belong to a unique class of solar system objects that has never been visited by spacecraft and which contain clues to the origin of our solar system.

The KBOs Hubble found are each about 10 times larger than typical comets, but only about 1-2 percent of the size of Pluto. Unlike asteroids, KBOs have not been heated by the sun and are thought to represent a pristine, well preserved deep-freeze sample of what the outer solar system was like following its birth 4.6 billion years ago. The KBOs found in the Hubble data are thought to be the building blocks of dwarf planets such as Pluto.

The New Horizons team started to look for suitable KBOs in 2011 using some of the largest ground-based telescopes on Earth. They found several dozen KBOs, but none was reachable within the fuel supply available aboard the New Horizons spacecraft.

"We started to get worried that we could not find anything suitable, even with Hubble, but in the end the space telescope came to the rescue," said New Horizons science team member John Spencer of SwRI. "There was a huge sigh of relief when we found suitable KBOs; we are 'over the moon' about this detection."

Following an initial proof of concept of the Hubble pilot observing program in June, the New Horizons Team was awarded telescope time by the Space Telescope Science Institute for a wider survey in July. When the search was completed in early September, the team identified one KBO that is considered "definitely reachable," and two other potentially accessible KBOs that will require more tracking over several months to know whether they too are accessible by the New Horizons spacecraft.

This was a needle-in-haystack search for the New Horizons team because the elusive KBOs are extremely small, faint, and difficult to pick out against a myriad background of stars in the constellation Sagittarius, which is in the present direction of Pluto. The three KBOs identified each are a whopping 1 billion miles beyond Pluto. Two of the KBOs are estimated to be as large as 34 miles (55 kilometers) across, and the third is perhaps as small as 15 miles (25 kilometers).

The New Horizons spacecraft, launched in 2006 from Florida, is the first mission in NASA's New Frontiers Program. Once a NASA mission completes its prime mission, the agency conducts an extensive science and technical review to determine whether extended operations are warranted.

The New Horizons team expects to submit such a proposal to NASA in late 2016 for an extended mission to fly by one of the newly identified KBOs. Hurtling across the solar system, the New Horizons spacecraft would reach the distance of 4 billion miles from the sun at its farthest point roughly three to four years after its July 2015 Pluto encounter. Accomplishing such a KBO flyby would substantially increase the science return from the New Horizons mission as laid out by the 2003 Planetary Science Decadal Survey.

The Hubble Space Telescope is a project of international cooperation between NASA and the European Space Agency. NASA's Goddard Space Flight Center in Greenbelt, Maryland, manages the telescope. The Space Telescope Science Institute (STScI) in Baltimore conducts Hubble science operations. STScI is operated for NASA by the Association of Universities for Research in Astronomy, Inc., in Washington.

The Johns Hopkins University Applied Physics Laboratory (APL) in Laurel, Maryland, manages the New Horizons mission for NASA's Science Mission Directorate. APL also built and operates the New Horizons spacecraft.

www.defense-aerospace.com/article-view/release/157962/predator%C2%A7gray-eagle-uavs-pass-3-million-flight-hours.html

Predator/Gray Eagle Series Surpasses Three Million Flight Hours.

WASHINGTON --- General Atomics Aeronautical Systems, Inc. today announced that its Predator/Gray Eagle-series aircraft family has achieved a historic company and industry milestone: three million flight hours which is the equivalent of flying over 340 years, around-the-clock, every day. The milestone occurred on October 2, with nearly 222,000 total missions completed and almost 90-percent of all missions flown in combat.

"Three million flight hours is a tremendous accomplishment that attests to the reliability and versatility of our proven technology," said Linden P. Blue, CEO, GA-ASI. "We strive to provide solutions that support the requirements of our customers but could not have reached this milestone without the hard work and dedication of our employees. We eagerly look forward to four million flight hours and beyond and will keep focusing on improving the mission capabilities of our systems because what they can do when they're flying is as important as keeping them airborne."

The identification of the specific aircraft and customer that achieved the milestone is unknown as every second of every day over 68 GA-ASI aircraft are airborne worldwide. On October 2, 133 GA-ASI-manufactured aircraft were airborne at some point during the day, including Predator A, Predator B/MQ-9 Reaper, Predator C Avenger, Gray Eagle, and Sky Warrior Alpha aircraft. Flight hours have continued to grow at unprecedented rates in recent years, with 500,000 flight hours achieved from 1993 to 2008, one million hours two years later in 2010, and two million hours just two years later in 2012.Â

Over the course of the last one million flight hours, GA-ASI has added substantial value to its aircraft family by making long endurance a key focus. In October 2013, Improved Gray Eagle (IGE), a next-generation derivative of the combat-proven Block 1 Gray Eagle unmanned aircraft system, completed its first endurance flight, flying over 45 hours. It is anticipated, with additional fuel, the IGE will have the potential to achieve more than 50 hours.

This past June, Predator B Extended Range (ER), an advanced derivative of the mission-proven Predator B/ RPA, conducted its inaugural long-range endurance flight, extending the aircraft's endurance from 27 to 34 hours. Â With additional fuel in the ER wings, the RPA soon will evolve to deliver 42 hours. Also in June, Predator XP, an updated version of the flagship Predator RPA that has been licensed for sale by the U.S. Government to a broader customer base, executed its first flight, offering up to 35 hours endurance.

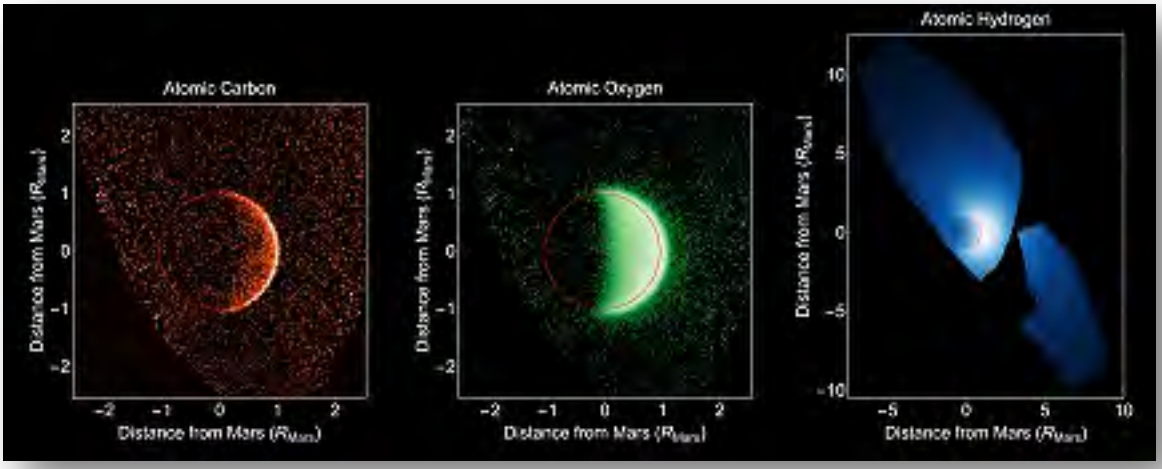
"Customer demand for Predator/Gray Eagle-series aircraft continues to accelerate flight hours amassed, and it's very timely for us to announce this milestone at the Army's largest trade show of the year as Gray Eagle was a significant contributor to this achievement," said Frank W. Pace, president, Aircraft Systems, GA-ASI. "At the same time, technology advances such as increased endurance are driven by customer input and supported by an exceptional team of partners, suppliers, and employees."

GA-ASI aircraft are currently logging nearly 50,000 flight hours a month supporting the U.S. Air Force, U.S. Army, U.S. Department of Homeland Security, NASA, the Italian Air Force, the Royal Air Force, the French Air Force, and other customers. Missions include helping protect warfighters in world hot spots; assisting border agents in monitoring the nation's borders; aiding first responders in the wake of natural disasters; and supporting scientists in performing Earth science missions.

These aircraft continue to maintain the highest operational availability rates not only in U.S. Air Force and U.S. Army aviation, but also in the U.K. inventory. GA-ASI has produced some 700 aircraft to date and is currently building six aircraft and two ground control stations (GCS) per month, with the capacity to double production if needed.

General Atomics Aeronautical Systems, Inc., an affiliate of General Atomics, delivers situational awareness by providing remotely piloted aircraft systems, radars, and electro-optic and related mission systems solutions for military and commercial applications worldwide. The company's Aircraft Systems business unit is a leading designer and manufacturer of proven, reliable, RPA systems, including Predator A, Predator B/MQ-9 Reaper, Gray Eagle, the new Predator C Avenger, and Predator XP.

www.nasa.gov/press/2014/october/nasa-mission-provides-its-first-look-at-martian-upper-atmosphere/



NASA Mission Provides Its First Look at Martian Upper Atmosphere

NASA's Mars Atmosphere and Volatile Evolution (MAVEN) spacecraft has provided scientists their first look at a storm of energetic solar particles at Mars, produced unprecedented ultraviolet images of the tenuous oxygen, hydrogen, and carbon coronas surrounding the Red Planet, and yielded a comprehensive map of highly-variable ozone in the atmosphere underlying the coronas.

The spacecraft, which entered Mars' orbit Sept. 21, now is lowering its orbit and testing its instruments. MAVEN was launched to Mars in November 2013, to help solve the mystery of how the Red Planet lost most of its atmosphere.

"All the instruments are showing data quality that is better than anticipated at this early stage of the mission," said Bruce Jakosky, MAVEN Principal Investigator at the University of Colorado, Boulder. "All instruments have now been turned on -- although not yet fully checked out -- and are functioning nominally. It's turning out to be an easy and straightforward spacecraft to fly, at least so far. It really looks as if we're headed for an exciting science mission."

Solar energetic particles (SEPs) are streams of high-speed particles blasted from the sun during explosive solar activity like flares or coronal mass ejections (CMEs). Around Earth, SEP storms can damage the sensitive electronics on satellites. At Mars, they are thought to be one possible mechanism for driving atmospheric loss.

A solar flare on Sept. 26 produced a CME that was observed by NASA satellites on both sides of the sun. Computer models of the CME propagation predicted the disturbance and the accompanying SEPs would reach Mars on Sept. 29. MAVEN's Solar Energetic Particle instrument was able to observe the onset of the event that day.

"After traveling through interplanetary space, these energetic particles of mostly protons deposit their energy in the upper atmosphere of Mars," said SEP instrument lead Davin Larson of the Space Sciences Laboratory at the University of California, Berkeley. "A SEP event like this typically occurs every couple weeks. Once all the instruments are turned on, we expect to also be able to track the response of the upper atmosphere to them."

The hydrogen and oxygen coronas of Mars are the tenuous outer fringe of the planet's upper atmosphere, where the edge of the atmosphere meets space. In this region, atoms that were once a part of carbon dioxide or water molecules near the surface can escape to space. These molecules control the climate, so following them allows us to understand the history of Mars over the last four billion years and to track the change from a warm and wet climate to the cold, dry climate we see today. MAVEN observed the edges of the Martian atmosphere using the Imaging Ultraviolet Spectrograph (IUVS), which is sensitive to the sunlight reflected by these atoms.

"With these observations, MAVEN's IUVS has obtained the most complete picture of the extended Martian upper atmosphere ever made," said MAVEN Remote Sensing Team member Mike Chaffin of the University of Colorado, Boulder. "By measuring the extended upper atmosphere of the planet, MAVEN directly probes how these atoms escape to space. The observations support our current understanding that the upper atmosphere of Mars, when compared to Venus and Earth, is only tenuously bound by the Red Planet's weak gravity."

IUVS also created a map of the atmospheric ozone on Mars by detecting the absorption of ultraviolet sunlight by the molecule.

"With these maps we have the kind of complete and simultaneous coverage of Mars that is usually only possible for Earth," said MAVEN Remote Sensing Team member Justin Deighan of the University of Colorado, Boulder. "On Earth, ozone destruction by refrigerator CFCs is the cause of the polar ozone hole. On Mars, ozone is just as easily destroyed by the byproducts of water vapor breakdown by ultraviolet sunlight. Tracking the ozone lets us track the photochemical processes taking place in the Martian atmosphere. We'll be exploring this in more complete detail during MAVEN's primary science mission."

There will be about two weeks of additional instrument calibration and testing before MAVEN starts its primary science mission. This includes an end-to-end test to transmit data between NASA's Curiosity rover on the surface of Mars and Earth using the MAVEN mission's Electra telecommunications relay. The mission aims to start full science gathering in early to mid-November.

MAVEN's principal investigator is based at the University of Colorado's Laboratory for Atmospheric and Space Physics. The university provided two science instruments and leads science operations, as well as education and public outreach, for the mission. The University of California at Berkeley's Space Sciences Laboratory also provided four science instruments for the mission. NASA's Goddard Space Flight Center in Greenbelt, Maryland manages the MAVEN project and provided two science instruments for the mission. Lockheed Martin built the spacecraft and is responsible for mission operations. NASA's Jet Propulsion Laboratory in Pasadena, California provides navigation and Deep Space Network support, as well as the Electra telecommunications relay hardware and operations.

For more about MAVEN, visit: http://www.nasa.gov/maven

http://media.chrysler.com/newsrelease.do?id=16112&mid=1

October 13, 2014 , San Antonio - Jeep® and Ram Truck brands took top awards at the 2014 Texas Auto Writers Association (TAWA) Texas Truck Rodeo. More than 60 TAWA members cast their votes after a two-day competition involving on- and off-road vehicle evaluations. While capability is an important element considered by TAWA jurors, the organization also studies design, utility, value and technology with detailed scoring in each category.

Chrysler Group LLC Scoops Up Nine Awards at 24th Annual Texas Truck Rodeo

- Jeep® Grand Cherokee wins "SUV of Texas" for the fifth consecutive year
- Jeep Wrangler and Jeep Cherokee take consecutive year-over-year titles
- Jeep brand SUVs victorious in every category entered
- Ram wins Heavy Duty Truck of Texas for the second consecutive year
- Ram Power Wagon scores Off-road Truck of Texas award
- Chrysler Group's 3.0-liter V-6 EcoDiesel engine and Uconnect system score top honors

"

Once again the Chrysler Group brought an extraordinary product lineup to the Texas Truck Rodeo," said Michael Marrs, TAWA president. "The performance and quality of the Jeep and Ram products at the Rodeo were impressive with powertrain and technology innovations that are tough to beat. The Jeep Grand Cherokee especially continues to outshine the competition by once again winning the SUV of Texas title."

The Jeep brand won all five categories entered, including the coveted "SUV of Texas".

"We are extremely delighted and proud that for the fifth consecutive year, the respected and influential Texas auto writers have named the Jeep Grand Cherokee the SUV of Texas," said Mike Manley, President and CEO — Jeep Brand, Chrysler Group LLC. "Even more impressive is the fact that Jeep vehicles won every single category in which they were entered, and were recognized for their unmatched 4x4 capability, fuel economy, luxury and overall performance.

"With Jeep sales up 45 percent so far this year, Texas remains a tremendously important SUV market," Manley added. "Over the past five years, we've proven that winning these TAWA awards increases Jeep showroom traffic and sales."

A total of 75 pickups, SUVs and crossover vehicles were entered in this year's rodeo. Ram Truck earned a repeating title as the Heavy Duty Truck of Texas.

“Exactly five years ago Ram Truck became its own brand and we set out to design and engineer the best trucks you can buy with fuel economy and capability top of mind,” said Bob Hegbloom, President and CEO — Ram Truck Brand, Chrysler Group LLC. “Winning back-to-back awards from the Texas Auto Writers Association affirms our direction in the truck market.”

Chrysler Group vehicles receiving awards at the 24th annual TAWA Texas Truck Rodeo were:

- SUV of Texas: 2015 Jeep Grand Cherokee
- Compact SUV of Texas: 2015 Jeep Cherokee
- Mid-size SUV of Texas: 2015 Jeep Grand Cherokee
- Luxury Mid-size SUV of Texas: 2015 Jeep Grand Cherokee Summit
- Off-road Utility Vehicle of Texas: 2015 Jeep Wrangler
- Heavy Duty Truck of Texas: 2015 Ram 2500 Heavy Duty
- Off-road Truck of Texas: 2015 Ram Power Wagon
- Best Powertrain: 3.0-liter EcoDiesel (Jeep Grand Cherokee, Ram 1500)
- Best Connectivity: Chrysler Group UConnect (Jeep, Ram, Dodge)

2015 Jeep Grand Cherokee

Jeep Grand Cherokee — the most awarded SUV ever and the vehicle that has long defined what a premium SUV should be — receives even more content for the 2015 model year. The Grand Cherokee Summit models receive added features as well as a new Summit California Edition appearance package that further enhances Summit’s premium exterior aesthetics.

Jeep Grand Cherokee delivers best-in-class 30 miles per gallon (mpg) highway courtesy of an available 3.0-liter EcoDiesel V-6 engine and standard eight-speed transmission. The 3.0-liter EcoDiesel V-6 boasts an unmatched driving range of more than 730 miles.

Legendary Jeep capability comes courtesy of three available 4x4 systems, Jeep's Quadra-Lift air suspension system and class-leading Selec-Terrain traction management system. Grand Cherokee boasts best-in-class towing of 7,400 pounds, and a crawl ratio of 44.1:1.

A refined exterior design — complete with available bi-xenon headlamps with signature LED daytime running lamps (DRL) — provides a premium appearance. Interior luxury is achieved with premium amenities, including Natura leather, exotic open-pore wood trim and unique color offerings.

The 2015 Jeep Grand Cherokee is available in five trim levels: Laredo, Laredo E, Limited, Overland and Summit.

2015 Jeep Cherokee

There is a new king of the hill in the mid-size sport-utility vehicle (SUV) segment: the 2015 Jeep Cherokee. The 2015 Jeep Cherokee delivers legendary Jeep 4x4 capability, premium on-road manners and superior ride and handling, a segment-exclusive nine-speed automatic transmission, fuel economy ratings of up to 31 miles per gallon (mpg) highway, world-class craftsmanship, leading-edge technology, more than 70 advanced safety and security features and best-in-class V-6 towing capability of 4,500 pounds.

Powered by a choice of two engines, three innovative 4x4 systems that feature the first use of a fully-automated disconnecting rear axle and Engine Stop-Start (ESS) technology that is standard on V-6-powered Cherokee models, the Jeep Cherokee revolutionizes the mid-size SUV segment. The Cherokee delivers leading-edge technology customers will value, world-class craftsmanship and clever features like the available 8.4-inch touch screen media center, the seven-inch full-color instrument cluster display, inventive storage solutions and cargo flexibility not found elsewhere in the segment with the Jeep Cargo Management system.

The all-new 2014 Jeep Cherokee is available in four different models in the United States: Cherokee Sport, Cherokee Latitude, Cherokee Limited and Cherokee Trailhawk, and has a starting U.S. Manufacturer's Suggested Retail Price of $22,995 (excluding $995 destination).

2015 Jeep Wrangler: The iconic Jeep Wrangler — the most capable and recognized vehicle in the world — moves into 2015 with updates designed to further enhance the Wrangler ownership experience, including a standard eight-speaker audio system and an improved sound bar, and an optional Premium Alpine Audio Package that includes nine Alpine speakers, a new subwoofer and a 552-watt amplifier. The new subwoofer has been relocated under the cargo floor for added cargo capacity. A new standard Torx Tool Kit comes with T-30, T-35, T-40 and T-50 torx heads, a ratchet and a storage pouch, making removing the doors, roof and front bumper end caps easier for owners.

The 2015 Jeep Wrangler Rubicon Hard Rock edition carries forward the capability enhancing features of the 2014 Rubicon X package, and adds the nine-speaker Premium Alpine audio system and a new Low Gloss Black grille with High Gloss Black inserts.

Jeep Wrangler Willys Wheeler, the widely popular model that salutes the earliest civilian Jeep vehicles with additional off-road hardware for increased capability, also returns for 2015.

The 2015 Jeep Wrangler delivers unmatched off-road capability with legendary four-wheel drive and is produced with more than seven decades of 4x4 engineering experience. Wrangler continues to offer a body-on-frame design, front and rear five-link suspension system, live axles, electronic lockers, and is one of the few mid-size SUVs that offers a six-speed manual transmission — in addition to its five-speed automatic transmission.

Jeep Wrangler has always had a unique variety of colors to choose from, and 2015 is no different. New exterior colors include: Baja Yellow, Copper Brown, Firecracker Red, Sunset Orange and Tank. Anvil, Billet Silver, Black, Bright White and Hydro Blue continue for 2015.

2015 Ram 1500: Fuel economy is the No. 1 purchase reason in the half-ton segment. The 2015 Ram 1500 holds the top two spots in fuel economy with winning powertrains: exclusive 3.0-liter V-6 EcoDiesel features 28 miles per gallon (mpg) with 240 horsepower, 420 lb.-ft. of torque and 9,200 pounds of towing capability. The Pentastar 3.6-liter V-6 with 305 horsepower owns best-in-class gasoline fuel economy of 25 mpg. Ram 1500 leads innovation with first-in-segment technologies: TorqueFlite eight-speed automatic transmission, stop-start system, thermal management system, pulse-width modulation and active aerodynamics, including grille shutters and air suspension. Additionally, the Ram 1500 features best-in-class aerodynamics of .360 Cd.

2014 Ram 2500, 3500 Heavy Duty and Ram Power Wagon

Ram Truck brand offers the most capable heavy-duty pickups in the segment — the 2015 Ram Heavy Duty line features a list of best-in-class titles in the segments number one purchase reason, capability:

- Towing — 30,000 pounds with Ram 3500
- Towing — 17,970 pounds with Ram 2500
- Payload — 7,390 pounds with Ram 3500
- Power — 865 lb.-ft. of torque with 6.7-liter Cummins
- Power — 410 horsepower and 429 lb.-ft. of torque with all-new 6.4-liter HEMI® V-8
- Capacity — Gross Combined Weight Rating (GCWR) of 37,600 pounds with Ram 3500
- Most off-road capable pickup — Ram Power Wagon

Ram 2500 and 3500 Heavy Duty trucks also add new innovation, including a 5-link coil suspension with optional air suspension on Ram 2500 and a supplemental air bag suspension option on Ram 3500. Additionally, Ram is the only truck manufacturer to feature SAE J2807 compliance across light-duty and heavy-duty truck segments.

3.0-liter V-6 EcoDiesel: Available in the 2015 Jeep Grand Cherokee and 2015 Ram 1500, the EcoDiesel is a turbocharged 60-degree, dual overhead camshaft (DOHC) 24-valve V-6 that produces 240 horsepower and 420 lb.-ft. of torque. The abundant torque is an enabler for impressive towing capacity while delivering best-in-class fuel economy in both the Jeep Grand Cherokee and Ram 1500. Like the 3.6-liter Pentastar V-6 and 5.7-liter HEMI V-8 gasoline engines, the EcoDiesel V-6 is mated to an 8-speed automatic transmission.

The EcoDiesel — developed and manufactured by VM Motori (a Chrysler supplier since 1992) — is one of the most advanced diesel engines in the marketplace. Equipped with a diesel oxidation catalyst, diesel particulate filter and selective catalytic reduction, it is emissions-compliant in all 50 states.

Uconnect: Chrysler Group's Uconnect systems include a range of hands-free communication, entertainment and navigation features. The systems are designed to keep consumers connected, entertained and most importantly — focused on the road. Uconnect's intuitive user interface is deemed one of the easiest-to-use in the automotive industry.

Chrysler Group has integrated consumer electronics technologies and features into the dashboard in a familiar manner to help ensure that critical information is shared between the Uconnect systems, the instrument cluster and vehicle audio system — so it is presented to the driver in the moment that they need it. Simplified steering wheel controls, hands-free voice commands and traditional knobs and buttons help drivers manage a range of entertainment, navigation, communication feature and connected services.

http://pressroom.toyota.com/releases/toyota+reveals+2015+camry+race+car.htm

Toyota Reveals 2015 Camry Race Car

First Manufacturer Redesign of NASCAR 'Gen-6' Model - October 11, 2014

CONCORD, N.C. (Oct. 11, 2014) -- Toyota Motor Sales, U.S.A., Inc. (TMS) and TRD, U.S.A. (Toyota Racing Development) today introduced the new 2015 Toyota Camry race car that will compete in NASCAR Sprint Cup Series (NSCS) competition beginning next season.

With the announcement of the 2015 Camry race car, Toyota becomes the first manufacturer in the series to update the NASCAR 'Gen-6' model -- which was initially introduced in 2012 for competition beginning during the 2013 season. In addition, a redesigned Camry will also be used in next year's NASCAR Xfinity Series, currently the Nationwide Series.

The 2015 Camry race car marks the culmination of a redesign to provide the vehicle with a more unique identity -- and a look similar to the 2015 production Camry that was introduced earlier this year. TRD worked together with Calty Design, part of Toyota's global network design team, to update the on-track Camry and incorporate design elements from the new 2015 production Camry into the race car.

"We're thrilled to finally be able to show off our new 2015 Camry race car -- becoming the first manufacturer to update the 'Gen-6' model that was introduced before the start of the 2013 season," said Ed Laukes, TMS vice president of marketing, performance and guest experience. "We anticipate that fans will appreciate the development behind this bold Camry design -- both on the race track and the showroom floor. Fans will have the chance to get an up close look at our new 2015 Camry in our NASCAR activation and fan engagement activities."

The boldest change to the new 2015 NSCS Camry is the aggressive front end and grill area, which looks exactly like its production counterpart. In addition, the new Camry boasts an all new, sleek hood and nose, along with a new tail of the car. A distinct change in the quarter windows also adds to the sleeker look.

"A lot of hard work has gone into redesigning the 2015 Camry race car for NASCAR competition," said David Wilson, TRD's president and general manager. "It was a challenging process balancing performance and design, but working closely with Calty Design, NASCAR and our race team partners, we were able to develop a race car that looks similar to its production counterpart -- and provide a performance upgrade on the race track."

For 12 straight years, and 16 of the past 17 years, the Camry has been the best-selling car in America. Built at Toyota manufacturing facilities in Georgetown, Ky. and Lafayette, Ind., the Camry has been named the 'Most American Car' by Cars.com's American-Made Index for four consecutive years.

In an effort to create more distinct and stock vehicles for the race track, NASCAR worked together with the three series manufacturers prior to the 2013 season to determine what areas were either 'locked in' or 'open' for unique design. NASCAR along with the manufacturers have also worked together to allow for updates to each manufacturer's design -- with Toyota being the first manufacturer to work through that update process.

"The redesigned Toyota Camry race car is a byproduct of the vastly improved collaboration that has taken place between NASCAR and its auto manufacturers during the past three years," said Steve O'Donnell, NASCAR's executive vice president and chief racing development officer. "Toyota's dedication to remodel its Gen-6 race car to more closely resemble its street production counterpart has been exemplary, and we look forward to watching it perform on the track each weekend in 2015."

The new 2015 Toyota Camry will make its NASCAR Sprint Cup Series debut at Daytona International Speedway during February's 'Speedweeks.'

http://corporate.ford.com/news-center/press-releases-detail/pr-20140925-5-millionth-f-series-super-duty

For 15 years, Ford F-Series Super Duty pickup trucks and chassis cabs – from F-250 to F-550 – have rolled off the assembly line at Kentucky Truck Plant and into the hands of hardworking customers.

"Super Duty trucks are engineered to meet the needs of the toughest customers," said Doug Scott, Ford Truck group marketing manager. "Their continued sales dominance with these demanding customers proves how hard they deliver."

- 5-millionth Ford F-Series Super Duty will roll off the assembly line at Kentucky Truck Plant in October, marking a major milestone for the best-selling heavy-duty pickup truck and chassis lineup
- Ford-designed, Ford-built second-generation 6.7-liter Power Stroke® V8 turbo diesel delivers best-in-class 440 horsepower and best-in-class standard diesel torque of 860 lb.-ft.; F-450 pickup boasts best-in-class towing of 31,200 pounds
- Super Duty is the No. 1 heavy-duty pickup truck, with a market share of 44 percent over the past year, according to IHS Automotive Polk data, and the first choice of tradespeople in the hardest-working industries* – from emergency vehicles to construction to mining
- Ford, America's truck leader, celebrates production of the 5-millionth Ford F-Series Super Duty next month.

Power and Efficiency: Truck customers demand maximum horsepower and torque to get the work done, but it's also important the powertrain be as efficient as possible to help keep operating costs low.

In 1999, the largest gasoline engine in the original Super Duty – the Triton 6.8-liter V10 – produced 275 horsepower and 410 lb.-ft. of torque, while the 7.3-liter diesel engine produced 235 horsepower and 500 lb.-ft. of torque.

Today, Super Duty's 6.2-liter gasoline V8 delivers 385 horsepower and 405 lb.-ft. of torque, and the 6.7-liter Power Stroke V8 turbo diesel supplies 440 horsepower and 860 lb.-ft. of torque. Both engines are more fuel-efficient than the 1999 powertrains.

Both of today's engines deliver power through the efficient TorqShift® six-speed SelectShift® Automatic transmission, while the transmission offerings in the 1999 Super Duty trucks were a four-speed automatic and six-speed manual – the latter available only with the diesel.

Today's TorqShift transmission offers live drive power takeoff, or PTO, to power auxiliary equipment such as snowplows, aerial lifts, tow truck lifts, cement mixers and dump trucks.

Super Duty trucks are known for their capability. For the 1999 F-350 Super Duty pickup, the maximum tow capacity rating was 14,600 pounds. Now, the 2015 F-450 Super Duty pickup leads the way with a best-in-class standard tow rating of 31,200 pounds, based on the Society of Automotive Engineers J2807 standard. That's 1,200 pounds more than the nearest competing crew cab 4x4 heavy-duty pickup.

With its new tow rating, the 2015 F-450 ups its already best-in-class gross combined weight rating from 40,000 pounds to 40,400 pounds – beating its nearest competitor by 2,500 pounds.

We Own Work: Ford F-Series Super Duty is the No. 1 heavy-duty pickup truck, with 44 percent market share over the past year, according to IHS Automotive Polk data, and the first choice of tradespeople in the hardest-working industries* – from emergency vehicles to construction to mining.

Super Duty is the market leader in a variety of fields, including:

- 72 percent of metal mining workers
- 70 percent of law enforcement agencies
- 54 percent of highway maintenance workers

Finite Elements in Fracture Mechanics	Prof. Dr. Meinhard Kuna
Time-Domain Finite Element Methods for Maxwell's Equations in Metamaterials (Springer Series in Computational Mathematics	*Jichun Li*
Finite Element Analysis: A Primer (Engineering)	*Anand V. Kulkarni - V.K. Havanur*
Finite Element Methods for Engineers	Roger T. Fenner
July 2013 Finite Element Mesh Generation	*Daniel Lo*
January 2013 The Finite Element Method: Theory, Implementation, and Applications (Texts in Computational Science and Engineering)	*Mats G. Larson -, Fredrik Bengzon*
January 2013 Finite and Boundary Element Tearing and Interconnecting Solvers for Multiscale Problems (Lecture Notes in Computational Science and Engineering)	*Clemens Pechstein*
January 2013 Structural Analysis with the Finite Element Method. Linear Statics: Volume 2: Beams, Plates and Shells (Lecture Notes on Numerical Methods in Engineering and Sciences)	*Eugenio Oñate*
Elementary Continuum Mechanics for Everyone: With Applications to Structural Mechanics (Solid Mechanics and Its Applications)	*Esben Byskov*

Jianming Jin (Author) - The Finite Element Method in Electromagnetics

Finite Element Analysis Theory and Application with ANSYS (3rd Edition)	Practical Stress Analysis with Finite Element	A First Course in the Finite Element Method
Saeed Moaveni	**Bryan J Mac Donald**	**Daryl L. Logan**
Finite Element Modelling Techniques in MSC.NASTRAN and LS/DYNA	Finite Element Analysis/formulation & verification	Introduction to Theoretical and Computational Fluid Dynamics
Sreejit Raghu	**B. A. Szabo**	**C. Pozrikidis**

Finite Elements in Fracture Mechanics **Prof. Dr. Meinhard Kuna**		**CAE design and sheet metal forming…** **Li Fei Zhou Deng**	**Applied Metal Forming**

Micro Metal Forming (Lecture Notes in Production Engineering)	**The Finite Element Method: Theory, Implementation, and Applications (Texts in Computational Science and Engineering) [Hardcover]**	

Viskoplastische Stoffgesetze für Thermoplaste in LS-DYNA: Theorie und Aspekte der Programmierung **Matthias Vogler**	Meshless Methods in Solid Mechanics **Youping Chen**	Geotechnical Earthquake Engineering **Steven Lawrence Kramer**
Fundamentals of Earthquake Engineering **Amr S. Elnashai**	Computational Fluid Dynamics **John David Anderson**	Computational Fluid Dynamics: A Practical Approach [Paperback] **Guan Heng Yeoh**
Biomechanical Systems Technology: Computational Methods **Cornelius T. Leondes**	Numerical response of steel reinforced concrete slab subjected to blast and pressure loadings in LS-DYNA. **Vivek Reddy**	Formulas for Mechanical and Structural Shock and Impact **Gregory Szuladziniski**

The Finite Element Method **Thomas J. R. Hughes**	Computational Fluid Dynamics **T. J. Chung**	