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Entering FEA Not To Miss (population - virtual) Welcome To Our Town

FEA Not To Miss Software & Engineering Solutions Town Hall Meeting & Gossip

## OASYS



CADFEM



**BETA CAE** 



#### Rescale



Audi







#### Altair



OZEN



## **ESI-GROUP**



Latitude Automobiles Quimper



LLNL



## ANSYS



SIEMENS



**JSOL** 



**General Motors** 



## FEA Not To Miss Profile

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The FEANTM publication is no fee to receive.

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Our goal is to share information on companies with expertise and innovative products. Strengths that rely on smart work ethics in today's changing world.

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Editors: (alpha order)

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## Table of contents MAY

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## Author/person who brought the article to our attention, or posted the article on social media

05 T 06 -	own Hall Meeting Town Map	g & Announcement	ts
07	M. Kempa	OASYS	Oasys Suite 18.0 released Oasys Primer
10	E. Bjorklund	DYNAMORE Nordic	Secure your seat at the Crash Analysis seminar on June, 14th,
11	C. Frech	DYNAMORE	3th European LS-DYNA Conference
13		SCALE	New YouTube channel - Introduction of ScALE.smd Webinar
14	C. Mueller	CADFEM	Now in English - CADFEM eLearning goes international
17		CADFEM Medical	Jaw replacement implants
18		LS-DYNA Multiphysics	LS-DYNA EM : Lenz's experiment
19	Elisa	D3VIEW	Layout Editor for Templates
20		JSOL	JFOLD Airbag-folding simulation with LS-DYNA
22		LS-DYNA Paper	Simulation Data Management from CAD to Results with LoCo and CAViT for Large Scale LS-DYNA® LEGO®
23		ANSYS	Driving on Sunshine with Lightyear One Ansys Icepak
25		ALTAIR	Systems Modeling News Room
27		LANCEMORE	New Simulation Videos
28		BETA CAE	KOMVOS
30	M. Ozen	OZEN Engineering	Vector Hysteresis in Solenoid Turbomachinery Simulation
32	S. McGinty	SIEMENS	NX Render Blog Series: The Visualization Process for Consumer Products – Part Two
36	A. Shapiro	Art's Blog	Past Favorite - The Phalanx® weapon system
37	J. Hales	Rescale	Webinar: Large-Scale Particle Simulation & Intelligent Computing - Rocky DEM and Rescale
38	M. Niess	ESI-Group	Empower Automakers to Engineer and Manufacture Multi- Material Assemblies with Confidence
41		Autodesk	Inventor - Professional-grade 3D CAD software for product design and engineering

# Table of contents

## All postings are copyright to the respective person and/or company

## Author/person who brought the article to our attention, or posted the article on social media

42	R. Oswald	NAFEMS	May Courses for eLearning
43		Y. Novozhilov	Calculation of aircraft impact load on the NPP island buildings
44		Hengstar	Shanghai Hengstar & Enhu Technology
45		Kaizenat	YouTube & Kaizen-DYNA APP
46		YouTube	Channels Not To Miss
47	M. Padilla	LLNL News	Different neutron energies enhance asteroid deflection
50		Latitude Automotive	Latitude Automobiles Quimper - Jerusalema DanceChallenge
51		Automotive	HUMMER EV SUV -2024 GMC
53		Automotive	Audi e-tron GT and RS e-tron GT - 2022
55	M. Font	Applus + IDIADA	S2A and IDIADA join efforts to investigate aerodynamics of real-driving events
56		Northrop	Northrop Grumman Completes Successful First Flight of
		Grumman	Japan's RQ-4B Global Hawk
57		US Airforce	AF Week in Photos

58	FEANTM	Marsha's Coffee & Gossip (and ranting and raving)
60	FEANTM	Papers
61	FEANTM	Tutorials
62	FEANTM	Guest
63	FEANTM	News
67	FEANTM	Not To Miss YouTube simulations
68	Latte & Grappa	recipe - Potato Balls

# Town Hall Meeting & Announcements

The respective websites will have the larger graphics, with full resolution.



Welcome to our monthly town hall meeting. Enjoy your coffee while reading our announcements, news, and hybrid magazine.

Our town comprises companies, engineers, scientists, mathematicians, universities, professors and students, consultants, and all individuals interested in software, hardware, and solutions. Oh, and gossip at the local coffee shop, and your pets are welcome.

As presiding town Supervisor, the first order of business is:

- The Jerusalema Dance Challenge pick of the month is the Latitude Automobiles Quimper team, (please note that the dance challenge area of the magazine will end in July)
- Oh, and John, Günter and Karl please sit down and stop gossiping by the coffee.

#### New Business temporary office permits:

- YouTube Channel Directory
- Featured publication abstract from DYNALook.com
- This month's choice for individual's YouTube Engineering simulations

#### Announcements by our calendar town secretary

Now	CADFEM	Now in English - CADFEM eLearning goes international		
Now	Oasys	Oasys Suite 18.0 released		
May 11 <sup>th</sup>	Altair	HPC Summit		
June 5 <sup>th</sup>	Ozen & ASME	ANSYS Mechanical Training: Structures under Thermal Stress - Linear &		
		Non-Linear FEA Applications		

#### New Building permits:

- For permits to be issued your plans must be approved by our Civil Engineering Dept.
- Meet in Room 12 (of course coffee will be served) and watch <u>LS-DYNA Civil/Structural</u> applications by Ben Shao
- the webinar shows how LS-DYNA is used in the civil domain to inform the design of complex buildings. Through project examples, a variety of applications will be shown including how LS-DYNA enables advanced seismic analysis of structures, complex soil-structure interactions and helps to overcome construction challenges.

## Town Map \*



Map Vector courtesy of vecteezy

- \* The logos displayed, of content in our magazine, do not represent their endorsement.
- \* To be removed, please notify <u>feaanswer@aol.com</u> with the request.
- \* Your town lot will be auctioned, with the Town applying all proceeds to the coffee budget.





Marta Kempa, MBA - Marketing Coordinator, Oasys LS-DYNA & Seppi

## **Oasys Software, Tutorials & Classes Not To Miss**



<u>Oasys Suite 18.0 released -</u> This new version of the software has exciting new features and updates within PRIMER, D3PLOT, T/HIS, REPORTER and SHELL to help you power through your workflow and achieve high-quality results.

Key highlights:

- D3PLOT Viewer a brand new 3D web viewer to transform the way you review, communicate, and deliver engineering analysis
- Power through your workflow by running LS-DYNA directly from PRIMER
- Impactful communication of your results with animations in REPORTER and MP4 movie output in D3PLOT
- Easier access to the powerful implicit analysis solver through a new tool for quick and easy set-up of implicit analyses

## View the complete on line courses, tutorials on our training page.

Oasys PRIMER Seat & Dummy	Advanced JavaScript
Positioning & Seatbelt Fitting	June 8th 3 days
May 05 - 2 days	

#### Not To Miss on YouTube



#### **Oasys Website**





Graphic © Arup / Husky Energy

#### Oasys PRIMER - Efficient, reliable model setup with support for all of the latest LS-DYNA features

Oasys PRIMER is the pre-processor designed to make preparation and modification of LS-DYNA models as quick and as simple as possible.

With support for every LS-DYNA keyword, you can read and write models with the confidence that no data will be lost or corrupted. The Oasys PRIMER user interface is designed specifically for LS-DYNA – with no compromises – giving you convenient access to a range of powerful pre-processing tools.

Model Setup	Model Manipulation	Model Validation
<ul> <li>Create and edit LS-DYNA entities using custom menus and a powerful keyword editing tool.</li> <li>Extensive connection tools including support for solid spotwelds, adhesive and bolted connections.</li> <li>Occupant modelling: simulation-based dummy positioning, seatbelt fitting, seat foam compression.</li> <li>Contact penetration detection and removal.</li> <li>Full support for INCLUDE and INCLUDE_TRANSFORM files with label range management and visualisation.</li> </ul>	<ul> <li>Quick access to part properties such as thickness and material.</li> <li>Mass balancing and assignment tools as well as mass calculation with mass- scaling effects.</li> <li>Part/assembly replace to update a model for design changes.</li> <li>Intelligent entity deletion with consideration for other dependent entities.</li> <li>Intelligent model merging with label clash resolution.</li> </ul>	<ul> <li>Viewing of most LS-DYNA entity types allowing visual checking.</li> <li>Viewing of connections and relationships between entities (Cross-References and Attached).</li> <li>Contouring of material properties, timestep, mass scaling, etc.</li> <li>More than 7000 LS-DYNA specific checks with error tree view for easy identification and fixing of multiple instances of similar errors.</li> <li>Intelligent model comparison detailing differences and changes.</li> </ul>





#### **Include File Management**

Oasys PRIMER fully supports INCLUDE and INCLUDE\_TRANSFORM files, and also has advanced tools for managing includ files and label ranges



#### Scripting

The JavaScript and Marcro functions provide you with powerful tools for creating your own scripts and interfaces for model generation and editing.

## **Occupant Modelling**

Oasys PRIMER has a number of tools to help you set up and position occupant dummies within a model. These include:

- Dummy positioning
- Adjusts seat positions with Mechanism
- · Precompress seat foam
- Seatbelt fitting, including automatic refitting after dummy repositioning





9

May



# DYNAmore Nordic DYNAmore Website



Elizabeth Mäki Björklund Sales Coordinator DYNAmore Nordic AB



Secure your seat at the Crash Analysis seminar on June, 14th, where the experienced lecturers Paul Du Bois and Suri Bala share their deep knowledge on crashworthiness simulations. Since each crashworthiness simulation is a compromise between complexity and accuracy, the user must be aware of the advantages and disadvantages of different kinds of modelling procedures depending on the purpose of the simulation. We hope to see your there!

The aim of the course is to show how to perform a crashworthiness simulation in the automobile industry using LS-DYNA, whereby the presented methods are transferable to other kinds of crashworthiness simulations (rail vehicles, components of vehicles, airplanes, vans, etc.).

As participants of this course, we expect new fellow employees from the department of crash simulation of a car manufacturer, new fellow employees of suppliers in the automobile industry (suppliers of components, engineering companies), or users in related industrial sectors.

Each crashworthiness simulation is a compromise between profitability and accuracy. At the moment there is no kind of a guideline for modeling and calculating crash. Therefore the user has to be aware of the advantages and disadvantages of different kinds of modeling procedures depending on the purpose of the simulation.

Particularly the aim of the course is to show how to perform an accurate and reliable crashworthiness simulation by thorough modeling and further understanding of the procedure.

## Content:

- Introduction to crash simulation using LS-DYNA, history, possibilities, technical limits, accuracy and reliability problems, future developments
- Modeling techniques for parts of car bodies: mesh-outlay, element quality, flanges and weld spots, contacts, etc.
- Modeling techniques for components consisting of other materials than steel: the motion of motor, tires, bolts, rubber buffer, etc.
- Selection and description of suitable material models in crashworthiness simulation for soft foams (chair cushions), EA-Foams, rubber, etc.
- Modeling of dummies with a determination of material parameters
- · Airbag simulation, reference geometries, folded airbags
- Modeling of barriers under extreme deformation
- User subroutines
- Quality control of models as well as analysis and evaluation of the results





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#### Save the date!

13<sup>th</sup> European LS-DYNA Conference October 5-6, 2021, Ulm, Germany

Conference Website: www.dynamore.de/en/conf2021

**Invitation:** We very much hope for a normalization of the situation and that we will be able to welcome the LS-DYNA users personally at a conference again next fall. We kindly invite all users of LS-DYNA, LS-OPT, and LS-TaSC to the 13<sup>th</sup> European LS-DYNA Conference at October 5-6, 2021 in Ulm, Germany. As usually the conference will be a great opportunity to talk with industry experts, catch up with colleagues and enjoy time exploring new ideas. In addition, attendees can meet with exhibitors to learn about the latest hardware and software trends as well as additional services relating to the finite element solver LS-DYNA, the optimization codes LS-OPT and LS-TaSC, and the pre- and postprocessor LS-PrePost. Training courses and workshops will also take place in the week before, during and after the conference.

**Venue:** The Congress Centrum Ulm is located directly on the river Danube. The city is best known for its cathedral, the highest church tower in the world and for being the birthplace of Albert Einstein.

Ulm is located directly on the A7 and A8 motorways and can be easily reached from Stuttgart and Munich airports.

Address: Basteistraße 40 89073 Ulm Telefon: +49 731 922990 Telefax: +49 731 9229930 <u>www.ulm-messe.de</u>

## Abstract submission

Please submit your abstract (maximum length 2,500 characters) by E-Mail to conf@dynamore.de or online at: <u>www.dynamore.de/en/2021-abstract</u>





## **Important Dates**

Abstract submission	: May 28, 2021
Paper submission:	September 3, 2021

Author notification: Conference date: July 9, 2021 October 5-6, 2021

## **Participant fees**

Industry speaker:	420 Euro
Academic speaker:	360 Euro
Industry:	640 Euro <sup>1)</sup> / 690 Euro
Academic:	490 Euro <sup>1)</sup> / 540 Euro
<sup>1)</sup> Registration before 30	June 2021. All plus VAT

## Exhibiting and sponsoring

Please request further information.

## Contact

DYNAmore GmbH Industriestr. 2, D-70565 Stuttgart, Germany Tel. +49 (0) 7 11 - 45 96 00 - 0 E-Mail:conference@dynamore.de

Conference Website: www.dynamore.de/en/conf2021





021 March 5

Webinar – Introduction of new

product generation SCALE.sdm



May

Introduction to the new product generation.

**YouTube Webinar -** The webinar introducing the new product generation SCALE.sdm took place on 5 March 2021

## YouTube Channel - SCALE GmbH



Presentation slides and video of the webinar "Introduction to the new product generation SCALE.sdm" can be downloaded here: <u>Webinar presentation (.pdf)</u> (page 4 starts English)







Dr. Markus Kellermeyer



## Video - CADFEM Learning

**Now in English - CADFEM eLearning goes** international with Brian Morris.

Now you can hear the training/seminars in English but you can still change it to hear the original German voice.

your platform for simulation training for engineers by engineers













SIMULATION IN DESIGN WITH CREO SIMULATION LIVE

CADFEM



STRUCTURAL MECHANICS NON-LINEAR STRUCTURAL MECHANICS CALCULATIONS

WITH ANSYS MECHANICAL

#### Can I test the eLearning offer without obligation?

To get a clear impression of our online learning format, we offer you a trial allowing you access to the starting module of an eLearning seminar of your choice. No costs, no cancellation period or anything similar. Moreover, with this free test access you can check all the technical requirements for a smooth learning process. You can easily request the free module from any eLearning course.



**The professional eLearning concept -** Learning on Demand offers so much more than online tutorials. You will benefit from the expertise of the very best CADFEM engineers and have the opportunity to learn when and where you choose. You will practice with up-to-date software on a virtual PC and also be able to use your personal reference book after the course has finished

- Multifaceted Contents Videos with experienced speakers, visualization on flipcharts, software demonstrations in Ansys, helpful understanding checks, and plenty of simulation exercises.
- 86% of our customers expect a mixture of theory and application in CADFEM training
- **Strong practical focus** Engineering and practice are at the heart of all online training. Ansys tutorials and exercises are integrated in a practical context.
- Flexible timing Knowledge "in store" or parallel to your next project: With Learning on Demand, you decide what to learn as well as when, where, and how.

.1



(Excerpt - please visit the website for complete information)



For over 35 years, the CADFEM Ansys Simulation Conference has been Europe's biggest annual user conference on numerical simulation. In 2020, for the first time in its long history, we had to cancel the conference in Germany, Austria, and Switzerland. We are back now in 2021! Visit our Site.

This gathering, centered on simulation and Ansys.

- in an attractive, digital format,
- split across the whole year,
- · focused on a selection of simulation-related topics
- free of charge.

## **OUR SIMULATION TOPICS AND CONFERENCE DATES 2021**

All are on a Thursday, 2021, starting at 2:00 p,m

May 06	CFD in Product Development - Controlling Flow and Optimizing Efficience
June 17	Products in Motion - Grasping Dynamics, and System Optimization
July 22	Simulation Platform - Shaping Processes and Workflows, Scaling Resources & Know-how
Sept 02	Mechanical Process Engineering - Mixing, Pouring, and Grinding
Sept 21	Using Simulation in Day-To-Day Design Engineering - Sound Decision-making and Fast- Paced Development
Oct 07	Additive Manufacturing - Optimized Components and Processes
Nov 11	FKM AND VDI, ETC Safe and Efficient Product Design
Dec 02	CADFEM MEDICAL CONFERENCE - In vivo, in Vitro, in silico





#### **CADFEM Medical**

CADFEM Medical is a certified simulation service provider and software manufacturer in the field of medicine and medical technology and is considered a pioneer of in silico medicine.

#### Jaw replacement implants

CADFEM

after To treat jaws tumor resections is a big challenge. Patient-specific implants are often used for this purpose. Due to very different loading cases and a disproportionately high effort for mechanical testing, these implants are designed purely basis on the of experience.



With the finite element method it is possible to carry out a simulation with realistic muscle forces from AnyBody with little effort. This makes it possible to realistically reproduce the loads on the implant, to objectively design the patient-specific implants for these loads and to improve the safety of the implants.









Subscribe now - Not To Miss LS-DYNA Multiphysics Channel LS-DYNA EM : Lenz's experiment

The temporal change of the magnetic field in the copper induces currents which themselves create an opposing magnetic field that brakes the fall.

As a result, an equilibrium for the magnet's velocity can be reached. This phenomena is also known as Lenz's law. The solver used here is the monolithic FEM-BEM LS-DYNA Electromagnetic solver. Another non conductor object of same weight is being dropped next to the magnet for reference.



**About Templates** 



## Layout Editor for Templates | by Elisa



Simlytiks Layouts can now be edited directly under a template. In the Templates application, open a template to edit it. Tab over to the Layout Section and use the list of responses to create pages populated with visualizations. The editor is set up just like Simlytiks and uses basic placeholders, so you can get an idea of how the exploration will look when the template is applied.

Templates, or data extractions, provide ways to dig deep into your data. They include no-code or low-code options for finding important insights, such as generating a 3D view of a driver-impact analysis. To learn more about

Data Extractions, please visit this page.



**About Layouts -** d3VIEW platform makes comparing of simulations and physical test responses simpler by providing the ability to save Simlytiks layouts to Templates. Use data extraction templates to pull more responses from data. Then, incorporate Simlytiks layouts to make data exploration more efficient. To learn more about the Simlytiks Layout feature, <u>please read</u> this blog post.





**JSOL-CAE** 





**Towards more accurate airbag deployment simulation -**JFOLD was developed to fold airbags for automotive crash simulation. JFOLD can be used to generate a folded airbag model using LS-DYNA simulation, regardless of the complexity of the geometry.

Airbags are one of the important safety devices for protecting the occupant during an accident: airbags are folded compactly and stored in the interior. The deployment behavior of an airbag depends on the pattern through which it is folded. The risk of occupant injury during airbag deployment, the out-of-position problem, considerably affects the occupant's safety performance.

Recently, the demand for more accurate airbag deployment simulation to improve the occupant's safety has been increasing. Building a folded airbag model with complicated geometry was an issue for CAE engineers to address.

JFOLD can manage the complicated folding process of an airbag using a flowchart in an easy-tounderstand tree view. Users can build, manage, and view the airbag models in various folding patterns. The intuitive and interactive GUI facilitates the operation of defining the position and behavior of the folding tools.

**Airbag-folding simulation with LS-DYNA -** JFOLD uses LS-DYNA, the proven simulation software in automotive crash simulation, to calculate the folding behavior.

Mav



**JFOLD uses Oasys Ltd. software PRIMER** - JFOLD uses the function of Oasys Ltd. software PRIMER which is a proven LS-DYNA pre-processor. JFOLD can also post-process using Oasys Ltd. software D3PLOT.

**JSOL-CAE** 

Airbag-folding process management with a flowchart (tree view) - JFOLD manages the complicated folding process using a flowchart, in a tree view.





The intuitive and interactive tool setting -The tool mesh can be set and modified: translation, rotation, folding, roll folding, and

**Airbag sewing simulation for 3D airbag -** JFOLD can perform 3D sewing simulation for building a 3D airbag model.







## Data Management from CAD to Results with LoCo and CAVIT for Large Scale LS-DYNA® LEGO® Crash

**Models** - LEGO<sup>®</sup> is a trademark of the LEGO Group of companies which does not sponsor, authorize or endorse these investigations.

- (1) Thorsten Gerlinger, David Koch, Andre Haufe,
- (2) Nils Karajan, Thomas Weckesser,
- (3) Pierre Glay,
- (4) Alexandru Saharnean, Marko Thiele 1 DYNAmore GmbH, 2 DYNAmore Corporation,
  - 3 DYNAmore France SAS, 4 SCALE GmbH

## Abstract

Given that in our professional lives we are dealing with highly sophisticated crash models on a daily basis, it seems obvious that we instantly thought we should be able to simulate a crash of a LEGO® Porsche Technic Model using the LS-DYNA FEM solver after seeing a video of a physical crash of this model on YouTube.Setting up a process, which involves every aspect of working with CAD data, meshing, dealing with solver files, submitting and monitoring the simulations, and finally handling the result files of simulations, is an important step when developing a Simulation Data Management (SDM) system such as LoCo and CAViT. Therefore we decided to use this LEGO® crash as a challenge and benchmark for our software. The real LEGO® models are often assembled with thousands of bricks. Handling so many parts in a SDM system on one hand and maintaining the ability to work on such models in a collaborative way with multiple users on the other is quite challenging. Initially, we set up the whole simulation process for the Porsche which is composed of 2704 individual bricks. But when we showed the results of the LEGO® Porsche crash simulation to the c't magazine (a widely read German computer magazine) and ADAC (General German Automobile Club) who had performed the initial physical crash test in 2017, they suggested doing another LEGO® crash scenario. This time a LEGO® Porsche was supposed to crash into a LEGO® Bugatti model at 60km/h and a LS-DYNA simulation should predict the outcome of the crash before the physical test was going to be conducted. The LEGO® set number 42083 of the Bugatti Chiron is even bigger than the Porsche model and consists of 3599 bricks. The results of the simulation were then evaluated and presented to ADAC and c't magazine to provide our prediction of the upcoming real physical crash. Later, the comparison of our prediction with the real crash results revealed that many details have been predicted correctly by the simulation. The final LS-DYNA model of both car models consisted of more than 45 million elements. Preprocessing as well as getting the model to run on an HPC system and handling the few but large result files has proven to be challenging in many ways.



May

Excerpts from the website. Please visit site for information.



Driving on Sunshine with Lightyear One - Lightyear, an automotive company in Helmond, the Netherlands, is revolutionizing the concept of the eco-friendly automobile by constructing the roof out of solar cells, so you can recharge the batteries as you drive along during the day.

It's almost like taking the charging station with you. The sun does all the work and tops off the batteries.

Lightyear, a member of the Ansys Startup Program has been designing the Lightyear One from scratch — including the lightweight aluminum and carbon fiber chassis, the four in-wheel motors, the powertrain and the solar roof — for maximum range and efficiency.

"Eco-conscious drivers are not worrying about how fast they can go from 0 to 100 kilometers per hour," says Andrea Carpi, Structural Lead Engineer at Lightyear. "They are looking for efficiency — getting the most range from a clean power source without having to stop frequently to recharge."

Carpi and his fellow engineers are using Ansys Mechanical, Ansys Fluent and Ansys HFSS to design the structural, aerodynamic, electromagnetic and thermal properties of the five-seat Lightyear One so you can drive up to 725 km (450 miles) on one charge. The solar cells, which stretch from the top of the windshield to back of the trunk, can add up to 12 km of range for every hour you drive in the sunshine. Lightyear One comes with a plug that fits into a regular wall outlet, but, depending on your driving habits and the amount of sunlight in your area, you may not have to use it much.



Engineering Everything All Over Again - While they learned a lot from the Bridgestone World Solar Challenge, as a commercial company Lightyear had to rethink their design with the consumer in mind, which meant reducing cost and increasing efficiency and comfort. After all, while motivated college engineering students might be convinced to forgo air conditioning during a long road trip in Australia, your average consumer is less likely to put up with the discomfort.

So they used what they had learned to redesign the solar car from scratch. The Ansys Startup Program helped them at this stage by enabling them to test structural, aerodynamic and electronic designs virtually, without incurring the costs of physical prototyping and testing.



May

### Excerpts from the website. Please visit site for information.



#### Ansys Icepak - Cooling Simulation Software for Electronic Components

Ansys Icepak is a CFD solver for electronics thermal management. It predicts airflow, temperature and heat transfer in IC packages, PCBs, electronic assemblies/enclosures and power electronics.

**Electronics Cooling & PCB Thermal Simulation and Analysis -** Ansys Icepak provides powerful electronic cooling solutions that utilize the industry leading Ansys Fluent computational fluid dynamics (CFD) solver for thermal and fluid flow analyses of integrated circuits (ICs), packages, printed circuit boards (PCBs) and electronic assemblies. The Ansys Icepak CFD solver uses the Ansys Electronics Desktop (AEDT) graphical user interface (GUI).

- Unstructured, Body-fitted Meshing
- Comprehensive Thermal Reliability Solution
- High-fidelity CFD Solver
- · Industry Leading Multiscale Multiphysics

**Among the Product Specs** - Perform conduction, convection and radiation conjugate heat transfer analyses, with many advanced capabilities to model laminar and turbulent flows, and species analysis including radiation and convection.

- MCAD and ECAD Support
- Solar radiation
- Parametrics and Optimization
- Customization and Automation
- Network Modeling
- DC Joule Heating Analysis
- · Electro-thermal and Thermo-Mechanical
- Extensive Libraries for Thermal
- Liquid Cooling
- Dynamic Thermal Management
- Varying Flow and Power ROM







<u>Systems Modeling</u> - Altair model-based development (MBD) tools drive fast development for smarter connected systems. Altair customers simulate complex products as systems-of-systems throughout your entire development cycle from early concept design to detailed design to hardware-in-the-loop testing (HIL). Explore more by combining mechanical models with electrical models (in 0D, 1D, and/or 3D) to enable multi-disciplinary simulation and leverage automatic code-generation for your next generation embedded systems.

May



- Math, Scripting, and Data Analysis Altair Compose® is an all-in-one environment performing a wide variety of math operations including linear algebra and matrix manipulations, statistics, differential equations, signal processing, control systems, polynomial fitting, and optimization. It provides a user-friendly, multi-language tool for performing calculations, and manipulating and visualizing data including from CAE and test results. Compose supports process automation and scripting for capturing repeated calculations.
- **Multi-Disciplinary System Simulation -** Altair Activate® rapidly models multi-disciplinary systems as 1D models. By simulating the performance of an entire product customers can understand overall behavior earlier and recognize key interactions between components and subsystems. Activate allows mixed signal-based and physical modeling including pre-defined libraries for mechanical, electrical, and thermal components. The powerful built-in functionality is extended by open standards such as Modelica and FMU to couple 1D and 3D models.
- Visual Environment for Embedded Systems Altair Embed® is a proven tool for model-based firmware development of embedded systems including motor control, IoT devices, and vision systems. With Embed, you can design, analyze, and simulate your embedded system using block diagrams and state charts, then automatically generate compact and optimized code to run on an extensive selection of microcontrollers from Texas Instruments<sup>™</sup>, STMicroelectronics®, Arduino®, Raspberry Pi<sup>™</sup>, and others. Hardware-in-the-Loop testing is fully supported using a high-speed bidirectional communication link for data collection and real-time tuning.



## Not to miss in the Altair Newsroom





**Disrupting the Traditional Injection Molding Process** 

Smart Products, IoT, and Digital Twins: What Do They Mean for Your Business?



Because Design Engineering is Already Hard Enough



The Pitfalls of a "Trial and Error" Approach to Manufacturing



## YouTube - LANCEMORE



No.507 Impact Analysis of Sabo Dam against Large...

No. 507 - Impact Analysis of Sabo Dam against Large Scale Debris Flow

Finite Element Analysis, Impact Analysis, Concrete Damage and Cracks, Fluid force, Gravity, Hydrostatic Pressure, Sediment pressure



No.179 Simulation of Underwater Explosion near...

of spent fuel pool by sine ...



No.506 Simulation of Headto-Windshield Impact using...



No.396 Granular Flow Simulation in the Hopper... No.475 Finite Element Analysis of Dam Break and...





# BETA CAE Systems



<u>KOMVOS</u> - The interactive console for browsing, visualizing and handling all the CAE data

**BETA Website** 

KOMVOS - SDM Console, is the point where data meet with their stakeholders in the context of simulation.

SDM Console is an innovative Simulation Data Management platform for the interactive browsing, visualization and handling of all data related to CAE analysis, from PDM extractions to simulation runs, key results and reports. With a user-friendly and intuitive interface that integrates a powerful 3D-viewer, SDM Console makes it possible to manipulate CAE models, get information on their meta-data, generate model reports and access model statistics with no need for prior knowledge of ANSA, META or any other SDM system.

Designed to be flexible and adaptable, SDM Console, serves the function of a powerful front end for data search, navigation and collaboration and can be integrated in all CAE environments, as it performs equally well with all CAE data management systems: From the smaller-scale file based ANSA-DM to corporate solutions such as SPDRM or any other 3rd party SDM system, SDM Console can become the single reference point for the management of all CAE data.

The function of SDM Console also spans beyond data browsing to data processing. Through this platform, it is possible to initiate data processing tasks on-line, by integrating existing workflows with custom action calls, or export data packages for off-line processing. This particular capability makes it ideal for the preparation and delivery of data packages to external services suppliers.



View Product <u>KOMVOS</u> Video on Website <u>PDF of Product Brochure</u> <u>PDF of KOMVOS - SDM Console Explained</u>



1P

# BETA CAE Systems







BETA CAE Systems YouTube Video Channel

May



Metin Ozen

Principal & CEO at Ozen Engineering, Inc. and Mallett Technology, Inc.

Ozen Engineering team put together a nice blog about <u>"Vector Hysteresis in Solenoid"</u> on our website. Easy read with YouTube videos explaining in more depth.

Additionally, Turbomachinery Simulation



## **Turbomachinery Simulation**

Rotating machines are extensively used in many industries such as Aerospace, Automotive, Datacenters Cooling, IT-Hardware, Medical devices, Energy, Oil and Gas, HVAC. Most common rotating machines are fans, pumps, compressors, and turbines.

The biggest challenges for delivering the future rotating machines are improving performance and reliability in addition to decreasing the cost. Aeroacoustics and NVH is becoming more and more important as the cars and devices are getting quieter and quieter. Improving efficiency and performance while decreasing noise and vibration could be predicted using high fidelity simulation methods. Ansys as a simulation lead in the market has very accurate workflows for modeling rotating machines. The initial design could be done in legacy tools such as Vista and BladeGen from which a high-quality 3D CAD may be exported to flagship meshing tool and solvers. TurboGrid is a custom-built mashing tool for turbomachines that can generate a high-quality grid in several simple steps in a very short time. CFX is the recommended tool in Ansys portfolio for rotating machines as it has a turbo mode that can make setting up the model much more convenient. Postprocessing is quite easy and powerful in CFD-Post using the turbo tab.

CFturbo is a new tool that can be added as an extension and could replace Vista and BladeGen for the conceptual/initial design stage. It makes it very convenient and easy for engineers to tweak the geometry of the turbomachine. CFturbo is totally compatible with Ansys Workbench and allows the parametrization of geometry and can export to meshing engines which makes it a perfect tool for optimization. Engineers can refine designs easily before physical tests are performed, accelerating the process while reducing risk and cost.





Simulating turbomachinery applications is usually e time-consuming due to its complicated nature. Only Ansys, with its powerful portfolio and its custom-built convenient turbomachinery workflow, is up to the challenge. More and more companies have used Ansys successfully for various rotating machine applications.

#### The following video series would include the following items on turbomachinery modeling:

Outline:	To learn more on how to perform CFD analysis on turbomachinery		
	devices, please watch these videos on our YouTube Channel:		
Introduction	Turbo youtube 1-introduction		
Axial Fan	Turbo youtube 2-Fan		
Mixed Compressor	Turbo youtube 3-compressor		
Meshing	Turbo youtube 4-Meshing		
Solution	Turbo youtube 5-Solution		
Postprocess	Turbo youtube 6-Postprocess		

#### Announcement - by Casey Hedari

June 5<sup>th</sup> - ASME & Ozen Engineering Partner to offer an 8 hr <u>ANSYS Mechanical Training:</u> <u>Structures under Thermal Stress - Linear & Non-Linear FEA Applications</u> (\$49 ASME member or \$109 for non-members). Register here: (You will also get 30 day Free Trial of ANSYS Mechanical!)

## YOUTUBE

System (TPMS) Antenna...



System (TPMS) Antenna...

Time Pressure Monitoring System (TPMS) Antenna...





NX Render Blog Series: The Visualization Process for Consumer Products – Part Two

May

By Shannon McGinty

## Introduction

Here we are with Part Two of our second series following the visualization process for consumer products. The same as our first series we will be moving onto all thing's materials in this instalment. You have probably guessed from our first series and Part One, that we will be joined once again by our visualization expert Gavin McCambridge. Gavin's knowledge and 20 years of experience are key in providing you with the best visualization tricks. Whether it be working with huge scales like the JCB, to now looking at the tiny details and specifics in a model like the Bosch coffee machine, we're bringing you it all. So, shall we get started?

## How to Gather Reference Images

How do you start by imagining your model and planning how it's going to look? I'm going to take a guess and say probably by looking up and researching reference imagery; and that's absolutely the best way. A simple Google search of your model, or similar, will give you the most accurate representation of the material finishes you want to aim for and provide you with a good guide.

"Although in some instances you may have access to prototypes or physical material samples, this simple technique is so easy to achieve a photo realistic look."

#### Тор Тір

"There are three things to consider when you're searching for your reference images. Try your best to find the actual model online, or at least a very similar one; and secondly, try to find close up images. This will help with material references for all the components, like plastics, metals and so on."







Something else to consider at this point in your research is the environment in which the product is likely to be set

May

(please visit their site for video)

## How to Apply Materials to your Model

If this is your first time applying materials to a model, don't worry, we're going to go step by step. Start by having your reference imagery to hand and the key here is to work from the outside in. This process of applying materials to the largest parts of the model first, and getting these correct, will make it more obvious to then work on the smaller and intricate details.

"Once the biggest parts have materials on, you'll start to get a feel for your model and how it's going to look as a finished design."

NX offers three methods for applying materials; to a component, to a face or to a solid body, this means you can select individual parts of the model to put materials on at a time. Although this may sound like it's going to prolong your design and visualization process, it's actually going to save you time as the solid body technique specifically allows you to drag-and-drop the same material if it is repeated on multiple parts. For example, if one side of the model is the same grey shade as another part, you can simply drop and duplicate this color onto a different solid body of the model.



(please visit their site for video)

Think about the lighting; is the setting interior or exterior? Day or night? Is the lighting natural or manmade? Keeping in mind all these types of questions will help you when referring to these images when polishing your model.







#### How to Edit a Material

Once you've got your materials mostly on your model and you've started to get an overall feel for how your model is going to look, you may start to see some discrepancies in your materials compared to the reference ones. Don't panic, that's ok, as this is easily amended.

"On your ribbon bar, you can navigate to the 'render' and enter 'studio task mode'. Click on 'materials in part' to see all the materials that are applied to your model. You can then select the material you're unhappy with and click 'edit'."

Like Gavin says here, you have the option to diffuse the color of your material. If the grey of one side needs to be slightly less dark, or darker, this enables you to drag a slide in whichever direction you need – simple! Just remember to confirm your changes once you're happy. How to Create an Emissive Material

This specific coffee machine has two light-emitting diodes (LEDs) on the front panel above the buttons. In order to create this in the model Gavin has used an emissive material. These particular materials can be found in 'System Studio Materials / Lights'. Once you have applied the material, you can then edit it by clicking on the materials in 'part tab' and navigate to the material you just applied.

"When I am editing this type of material, I like to have open the Ray Traced Studio window so I can get good feedback on the material that I am editing. To edit the 'lit' material, right-click on the material and navigate to 'Edit'." **SIEMENS** 



## **Applying Decals**



You may remember that we looked at decals in series one, but just in case – a decal is an additional piece of data you can apply to existing geometry, think of them as stickers! With this model in particular, the Bosch branding is the decal that we're looking at specifically.

"One tip here is to change your file filters to include PNG Files. This change is important as they support transparent backgrounds. For this model in particular, you want to make sure you've chosen 'center' as your anchor point to ensure that the decal is aligned to the center point of the image when applied."

Decals are an important step in the visualization process that really propel your design into looking like the real-life model. NX offers a mix of small, detailed changes to emphasize and highlight the subtle changes that make the biggest difference. For example, you can also look at determining the orientation of your decal and the scale of it. These combined with the correct location alignment and reflectivity, really tie your model and its overall look together.

#### TOP TIP

"When applying a decal there are a number of steps that you will need to follow to get it setup correctly. First off, select the faces that you want the decal to cover, then choose the image file you want to use. Next, specify up vector, and specify normal vector. Lastly, set the scale of the decal."

#### Summary

Just like that, part two of this series is complete. Hopefully this installment, along with the materials blog in Series One, has helped you to build your confidence and you can feel yourself becoming more of an expert in the visualization process! By bringing you such diverse examples like the large scale JCB and this smaller, delicate model we are providing you with the perfect mix for showcasing how this process can be applied to all models and still produce the same quality of beautiful renders. Don't forget to stay up to date with our posts so you don't miss Part Three, lighting your scene!

May



Art's News/Blog Editor: Art Shapiro

#### Past Favorite -The Phalanx® weapon system



Mutifunctional - The Phalanx weapon system carries out functions usually performed by multiple systems: search, detection, threat evaluation, tracking, engagement and kill assessment.

The Block 1B version adds control stations that allow operators to visually track and identify targets before engagement. With an added forward-looking infrared sensor, the 1B variant can be used at sea against helicopters and high-speed surface craft and on land to help identify and confirm incoming threats.

The Phalanx weapon system is installed on all U.S. Navy surface combatant ship classes and on those of 24 allied nations. The land-based version is forward deployed and has been used in combat.

#### Last line of defense

About Art (pdf)

#### **Raytheon website information**

The Phalanx® weapon system is a rapid-fire, computer-controlled, radarguided gun that can defeat anti-ship missiles and other close-in threats on land and at sea.

Double duty - At sea, navies use Phalanx to defeat anti-ship missiles and close-in threats that have pierced other lines of defense. On land, the U.S. Army uses the weapon system to detect and counter rocket, artillery and mortar systems.

#### Video YouTube Phalanx weapon system



May



## Webinar: Large-Scale Particle Simulation & Intelligent Computing - Rocky DEM and Rescale



**Moderator - Jolie Hales -** Intelligent computational techniques and advanced engineering simulation capabilities are enhancing the understanding of how bulk materials behave. Engineers and researchers use these tools extensively as the rapid rate of innovation requires them to accelerate their development processes as well as increase the fidelity of their solutions.

In this webinar, we will present how engineering innovators leverage Rocky DEM and the Rescale platform to amp up the pace of the technological breakthroughs while driving down the cost of product development by modeling realistic materials and solving the resulting mathematical model on highly optimized supercomputer configurations in the cloud.

The webinar includes a product demo and will conclude with a Q&A session.

## **Additional Videos**







BLOG - Empower Automakers to Engineer and Manufacture Multi-Material Assemblies with Confidence By Matthieu Niess

Virtual Prototyping represents an end-to-end approach for early validation of material and design choices, manufacturing and assembly process strategy, with significant benefits over the complete body development cycle.



Matthieu Niess - Industry Program Leader joined ESI in 2020, bringing with him his expertise in the automotive industry for both Body Engineering & Manufacturing, with a specialty for multi-material and electrification challenges.



Product - ProCAST

#### Simulate the Complete Casting Process for Defect-Free Parts Every Time With a Single Tool

Your first off-tool parts are finally available, only for you to realize they contain pinholes, shrinkage, or hot spots. With your deadline staring you in the face, you can either ship the parts and undoubtedly deal with an unhappy customer or go back to the design stage and try to identify the problem, correct it, and hope it is finally free from defects. And because the trial period in the casting development schedule is underestimated, it is imperative to get your gating design to be robust against process variations before arriving at the testing phase.

Simulation allows for virtual testing early on in the development stage. Accurate prediction and quantification of defects and process design are imperative in order to 'get it right' during production trials.

With ESI ProCAST you can cast your parts right the first time, every time –meeting your deadlines and never wasting money on scrap parts or late redesigns. For decades, customers have relied upon ProCAST as their go-to tool for the casting basics – filling, solidification, and porosity prediction. With its finite element technology, it also predicts complex issues like deformations and residual stresses and comprehensively addresses most castable alloys and most casting processes like sand castings, die castings, investment castings, and multiple variants associated with these processes.



## Benefits of ProCAST

- Predict, analyze, measure and quantify the most common casting defects in the earliest stages of design (E.g., Volume of porosity measured, as in Tomography)
- Simulate the entire process from furnace to final casting to capturing and tracking all physics.
   (E.g., Start with the dosing of the sleeve to predict early air entrainment)
- Comprehensively compute radiation with view factors to account for the shadowing effects, common in high-temperature investment castings
- Compute stresses through the process, both during solidification inside the mold and cooling outside the mold, predict final distortions and evaluate them easily with 3D scanner measurements
- Predict grain structure including equiaxed & single crystal, microstructure, and mechanical properties
- Automatically determine the casting part's best process window to reach the final quality goal through DOE, Optimization & Process Robustness analysis

## Sand Castings

The key to success in a sand casting foundry is optimizing the gating system and eliminating the risk of shrinkage porosity. ESI's ProCAST allows comprehensive modeling of any sand casting process, including high-pressure molding lines. It enables users to study the effects of feeder locations, filters, chills, insulation & exothermic sleeves on the casting process and quality. Different aspects, including filling, solidification & residual stresses can also be studied.



The standard porosity model of ProCAST also accounts for the effect of the expansion of cast iron during solidification and mold rigidity, which allows or restricts this expansion. A more comprehensive approach consists of running coupled, thermal microstructure and porosity calculations, including inoculation. The microstructure solver computes the evolution of different phases and predicts local density variations, which provide more realistic porosity results. Specific microstructure models exist for different cast irons: GI, SGI, CGI, and Ni-Resist.



**Die Castings** 



Reproduce shop floor conditions by performing several production cycles and obtaining steady-state die temperatures, thereby studying filling, solidification, intensification pressure effect, cooling channel design & process parameters optimization.

Die Casting machine is integrated inside ProCAST, enabling a real-time piston control and, hence, accurate selection of the right machine. Vacuum process, gas porosity – due to undissolved hydrogen, stresses in casting, stress release on die removal & part ejection, and die life – can all be predicted to reduce manufacturing costs and assess in-service part performance. Specific needs including squeeze, semi-solid materials, shot sleeve modeling for cold chamber, gooseneck modeling for hot chamber machines, and riser tube modeling in low pressure die castings can be attained. Gravity die casting, including tilt pouring processes, can be modeled, and ProCAST enables free definition of the axis and velocity of rotation.

#### **Investment Castings**



ProCAST can automatically generate a mesh representing the shell mold suitable for Investment Castings & Shell Molding processes. Furthermore, it has dedicated features to address the specific needs of investment casting foundries, like allowing for non-uniform shell thickness to be blended and multiple shell layers to be created. Also, radiation with view factors, including shadowing effects critical for hightemperature alloys, are considered.

#### Above is an excerpt - Complete product information can be found on their website





#### **View Overview Video on website**



## Inventor - Professional-grade 3D CAD software for product design and engineering

## Overview - Work with a complete set of design and engineering tools

Inventor® CAD software provides professional-grade 3D mechanical design, documentation, and product simulation tools. Work efficiently with a powerful blend of parametric, direct, freeform, and rules-based design capabilities.

#### Features - (excerpt from website) -

Mechanical design and 3D CAD software - Use Inventor® 3D CAD modeling software for product and mechanical design. Learn about the Inventor modeling, design, simulation, and rendering features.



#### Collaboration

**Product design** 





Bought to our attention by Roger Oswald



These are difficult times. Traditional methods of training are changing. NAFEMS is stepping up to the challenge by providing you with a range of training options, all available remotely, all available from home, and all keeping to the same, internationally renowned, independent standards.

## Among the many courses and training options offered are the following eLearning, Online:

May 11	eLearning, Online	Fatigue & Fracture Mechanics in FEA
May 17	eLearning, Online	Practical Modelling of Joints and Connections
May 28	eLearning, Online	Structural Optimization in FEA
June 02	Webex - Online	System Modeling & Simulation
June 09	eLearning, Online	Elements of Turbulence Modeling
June 17	eLearning, Online	Basic Finite Element Analysis
June 22	eLearning, Online	Composite Finite Element Analysis
June 25	eLearning, Online	Introduction to Dynamics using FEA
July 07	eLearning, Online	CFD for Structural Designers & Analysts
Aug 03	eLearning, Online	Fatigue & Fracture Mechanics in FEA
Aug 05	eLearning, Online	Non-Linear FEA
Aug 11	eLearning, Online	Introduction to Practical FEA
Aug 13	eLearning, Online	Advanced FEA

- **e-learning** World-class online training from the experts on a range of topics. you and your team can use a combination of live sessions, discussion forums, and recorded sessions to learn.
- **virtual classrooms -** Our best-in-class public training courses, now being delivered entirely online. complete courses delivered in full day sessions over the course of one or more days.
- **custom classes -** Our custom classes cover whatever topics you need, with examples related to your industry, in a private, online delivery format that suits you and your team precisely.
- **learning modules -** online, self-paced learning with tutor support. Learn at your own pace, with experienced guidance on-hand all the way.
- **learning hub -** guided learning, exclusive to nafems members. From key concepts to detailed learning, there's something for everyone.





## Yury Novozhilov

LS-DYNA Evangelist and Head of HPC at CADFEM CIS



YouTube - <u>Calculation of</u> aircraft impact load on the NPP island buildings

This year I had the honor to represent CADFEM CIS at the outstanding event from ANSYS - Simulation World 2021.

I am happy to share with you a recording of my live workshop "Calculation of aircraft impact load on the NPP island buildings", resulting from our research.

Simulation of such complex processes of dynamic impact loading of reinforced concrete becomes possible by using the capabilities of LSDYNA and cloud-based HPC resources.









Shanghai Hengstar & Enhu Technology sells and supports LST's suite of products and other software solutions. These provide the Chinese automotive industry a simulation environment designed and ready multidisciplinary engineering needs, and provide a CAD/CAE/CAM service platform to enhance and optimize the product design and therefore the product quality and manufacture.

#### Contact us for our LS-DYNA training courses and CAD/CAE/CAM consulting service, such as

- Crashworthiness Simulation with LS-DYNA
- Restraint System Design with Using LS-DYNA
- LS-DYNA MPP
- Airbag Simulation with CPM
- LS-OPT with LS-DYNA

**Our classes** are given by experts from LSTC USA, domestic OEMs, Germany, Japan, etc. These courses help CAE engineers to effectively use CAE tools such as LS-DYNA to improve car safety and quality, and therefore to enhance the capability of product design and innovation.

**Consulting** - Besides solver specific software sales, distribution and support activities, we offer associated CAD/CAE/CAM consulting services to the Chinese automotive market.

**Solutions** - Our software solutions provide the Chinese automotive industry, educational institutions, and other companies a mature suite of tools - powerful and expandable simulation environment designed and ready for future multidisciplinary CAE engineering needs.

Shanghai Hengstar provides engineering CAD/CAE/CAM services, consulting and training that combine analysis and simulation using Finite Element Methods such as LS-DYNA.



Contact: Shanghai Hengstar Technology Co., Ltd

hongsheng@hengstar.com



## Kaizenat Website



#### Kaizenat Support YouTube



Simulation world I World largest Engineering...



Kaizenat | Live Webinar | ANSYS | LSDYNA |...



 Solution
 Solution
 Products
 Products
 LS-DYNA
 LS-PrePost
 LS-OPT
 LS-TaSC
 LSTC Dummies & Barriers
 LSTC Dummies & Barriers

#### Kaizen-DYNA App

- "Kaizen-DYNA" is a mobile and web based application which is built by Kaizenat Technologies Private Limited (KTPL) to help LS-DYNA users across the world.
- This powerful application helps LS-DYNA users across the world to stay connected and also help each other by sharing their knowledge.
- The key feature of this application is QUERY and RESPONSE. Where a user can post and respond to queries. The best response for each query will be rewarded with a Kaizen score.
- This application also gives an opportunity for the employers to float their LS-DYNA job openings and alert its user's base with a notification.
- "Kaizen-DYNA" quiz program can help LS-DYNA users to update their knowledge score and trend top in the job seekers list.
- It also gives an opportunity for new users to learn LS-DYNA with training materials FAQ modules.
- This application also brings latest news about LS-DYNA and some useful general information.



## Ameen Topa

## ANSYS

**Luri Engineering** 

**CADFEM** 

BETA CAE Systems

Kaizenat

LS-DYNA Multiphysics

Mallet Technology

Oasys LS-DYNA Env.

**Ozen Engineering** 

**DYNAMORE GmbH** 

Rescale

Predictive Engineering

**Siemens** 





#### Different neutron energies enhance asteroid deflection

Michael Padilla



A standoff detonation of a nuclear device irradiates an asteroid and deposits energy at and beneath the surface. In this work, two neutron yields (50 kt and 1 Mt) and two neutron energies (14.1 MeV and 1 MeV) were the primary case studies compared side-by-side. The black dots represent the location of the standoff nuclear device. The colors in the asteroids show the intensities and distributions of differing neutron energy depositions. The dark blue color indicates where the asteroid remains solid. All other colors are where material is melted and/or vaporized, which allows for blowoff debris to be ejected, changing the asteroid's velocity and deflecting it. Note that the asteroid considered in this research was 300 meters in diameter, but the visuals above show much smaller asteroids with 0.8m and 5m diameters -- this is solely for the purpose of visualization, to enlarge the area of the energy deposition.

A research collaboration between Lawrence Livermore National Laboratory (LLNL) and the Air Force Institute of Technology

(AFIT) investigates how the neutron energy output from a nuclear device detonation can affect the deflection of an asteroid.

Scientists compared the resulting asteroid deflection from two different neutron energy sources, representative of fission and fusion neutrons, allowing for side-by-side comparisons. The goal was to understand which neutron energies released from a nuclear explosion are better for deflecting an asteroid and why, potentially paving the way for optimized deflection performance.

The work is featured in Acta Astronautica and was led by Lansing Horan IV, as part of a collaboration with LLNL's Planetary Defense and Weapon Output groups during his nuclear engineering master's program at AFIT. Co-authors from LLNL include Megan Bruck Syal and Joseph Wasem from LLNL's Weapons and Complex Integration Principal Directorate, and the co-authors from AFIT include Darren Holland and Maj. James Bevins.

Horan said the research team focused on the neutron radiation from a nuclear detonation since neutrons can be more penetrative than X-rays.

"This means that a neutron yield can potentially heat greater amounts of asteroid surface material, and therefore be more effective for deflecting asteroids than an X-ray yield," he said.





Neutrons of different energies can interact with the same material through different interaction mechanisms. By changing the distribution and intensity of the deposited energy, the resulting asteroid deflection also can be affected.

The research shows that the energy deposition profiles — which map the spatial locations at and beneath the asteroid's curved surface, where energy is deposited in varying distributions — can be quite different between the two neutron energies that were compared in this work. When the deposited energy is distributed differently in the asteroid, this means that the melted/vaporized blow-off debris can change in amount and speed, which is what ultimately determines the asteroid's resulting velocity change. Defeating an asteroid

Horan said there are two basic options in defeating an asteroid: disruption or deflection.

Disruption is the approach of imparting so much energy to the asteroid that it is robustly shattered into many fragments moving at extreme speeds.

"Past work found that more than 99.5 percent of the original asteroid's mass would miss the Earth," he said. "This disruption path would likely be considered if the warning time before an asteroid impact is short and/or the asteroid is relatively small."

Deflection is the gentler approach, which involves imparting a smaller amount of energy to the asteroid, keeping the object intact and pushing it onto a slightly different orbit with a slightly changed speed.

"Over time, with many years prior to impact, even a miniscule velocity change could add up to an Earthmissing distance," Horan said. "Deflection might generally be preferred as the safer and more 'elegant' option, if we have sufficient warning time to enact this sort of response. This is why our work focused on deflection."

## Connecting energy deposition to asteroid response

The work was conducted in two primary phases that included neutron energy deposition and asteroid deflective response.

For the energy deposition phase, Los Alamos National Laboratory's Monte Carlo N-Particle (MCNP) radiation-transport code was used to simulate all of the different case studies that were compared in this research. MCNP simulated a standoff detonation of neutrons that radiated toward a 300 m SiO2 (silicon oxide) spherical asteroid. The asteroid was divided by hundreds of concentric spheres and encapsulated cones to form hundreds of thousands of cells, and energy deposition was tallied and tracked for each individual cell in order to generate the energy deposition profiles or spatial distributions of energy throughout the asteroid.





For the asteroid deflection phase, LLNL's 2D and 3D Arbitrary Lagrangian-Eulerian (ALE3D) hydrodynamics code was used to simulate the asteroid material's response to the considered energy depositions. The MCNP-generated energy deposition profiles were imported and mapped into the ALE3D asteroid in order to initialize the simulations. The resulting deflection velocity change was obtained for various configurations of neutron yields and neutron energies, allowing for the effect of the neutron energy on the resulting deflection to be quantified.

One small step for deflection

Horan said the work is one small step forward for nuclear deflection simulations.

"One ultimate goal would be to determine the optimal neutron energy spectrum, the spread of neutron energy outputs that deposit their energies in the most ideal way to maximize the resulting velocity change or deflection," he said. "This paper reveals that the specific neutron energy output can impact the asteroid deflection performance, and why this occurs, serving as a stepping stone toward the larger goal."

Horan said the research showed that precision and accuracy in the energy deposition data is important. "If the energy deposition input is incorrect, we should not have much confidence in the asteroid deflection output," he said. "We now know that the energy deposition profile is most important for large yields that would be used to deflect large asteroids."

He said if there were to be a plan to mitigate a large incoming asteroid, the energy deposition spatial profile should be accounted for to correctly model the expected asteroid velocity change.

"On the other hand, the energy coupling efficiency is always important to consider, even for low yields against small asteroids," he said. "We found that the energy deposition magnitude is the factor that most strongly predicts the overall asteroid deflection, influencing the final velocity change more than the spatial distribution does."

For planning an asteroid mitigation mission, it will be necessary to account for these energy parameters to have correct simulations and expectations.

"It is important that we further research and understand all asteroid mitigation technologies in order to maximize the tools in our toolkit," Horan said. "In certain scenarios, using a nuclear device to deflect an asteroid would come with several advantages over non-nuclear alternatives. In fact, if the warning time is short and/or the incident asteroid is large, a nuclear explosive might be our only practical option for deflection and/or disruption."



M. Azadian - M. Victory - Editor's choice - Great dancing - Not to miss the lady in the spike heels -We congratulate her - it's difficult to do the Jerusalema dance challenge in spike heels!



Latitude Automobiles Quimper



## Jerusalema Challenge By Latitude Automobiles

May

After the Pleasure of Driving, the pleasure of dancing!

The Latitude Automobiles Quimper team played for the #JerusalemaChallenge and here is the result.

Thank you to the whole team for their participation and these good times in our dealership!

Music: Master KG - Jerusalema [Feat. Nomcebo]









### **Excerpt - General Motors**



# 2024 GMC HUMMER EV SUV Offers New Tactical Tech

Enhanced off-road proportions meet new features, including trail mapping and Power Station generator

DETROIT – GMC's electric supertruck lineup expands with the addition of the 2024 HUMMER EV SUV — and it is loaded with smart, purposeful technology.

"GMC's HUMMER EV SUV offers an exceptional balance of on-road performance and off-road capability, enhanced by a unique structure that allows for our signature open-air experience," said Al Oppenheiser, HUMMER EV chief engineer. "New features debuting on the SUV reinforce its role as a tactical tool in almost any situation."

New technologies include trail mapping available via the redesigned myGMC app1, and a new available Power Station generator2 that enables customers to utilize up to 3 kilowatts of power from the vehicle, turning the HUMMER EV SUV into a power source on the trail or a backup generator.



## Additional highlights:

#### See website to play video -

HUMMER EV's interdependent body/battery structure enables the Infinity Roof on the EV pickup as well as the SUV, and expected best-in-class off-road proportions help make the new SUV even more maneuverable — while making the most of the HUMMER EV's signature features such as available CrabWalk, available Extract Mode and more.

- Interdependent body/battery structure that supports a unique, double-stacked battery pack
- An available three-motor Ultium Drive system that delivers up to 830 horsepower and up to 11,500 lb-ft of torque — enough power for super-fast 0-60-mph sprints in approximately 3.5 seconds with available Watts To Freedom5 (based on GM estimates)
- New satellite-rendered trail mapping power allows drivers to discover and navigate off-road trails, while monitoring their vehicle's energy consumption in real time, with community-based energy forecast through their myGMC app1

## Automotive - GMC



- New available Power Station generator2 that enables 19.2kW AC charging, generator functionality (120v/25A/3kW) and ability to charge other EVs (240v/25A/6kW)
- Great degree of customization via buttons on the center stack, and nearly 200 accessories will be available for HUMMER EV
- Master of maneuverability, with nearly 9-inch less wheelbase than HUMMER EV Pickup, giving it expected best-in-class off-road proportions, with greater departure and breakover angles and a tighter turning circle of only 35.4 feet (10.8 meters) with 4 Wheel Steer
- An immersive experience that puts the driver at the center of every moment, including customizable user experience features and an open-air driving experience, with the standard Infinity Roof with removable Sky Panels and I-Bar

The HUMMER EV SUV is driven by General Motors' Ultium Platform and launches with the exclusive Edition 1 package, offered in Moonshot Green Matte6 available with or without the Extreme Off-Road Package, for greater customer choice in tailoring the vehicle for maximum driving efficiency or maximum off-road capability.



**View video on website** - Master of Maneuverability -With a nearly 9-inch shorter wheelbase than the HUMMER EV Pickup, the all-new HUMMER EV SUV offers even greater maneuverability, with expected bestin-class off-road proportions and a turning circle of only 35.4 feet (10.8 meters) with 4 Wheel Steer — smaller than a Mustang Mach-E.







## 2022 Audi e-tron GT and RS e-tron GT

(Excerpt - please visit Audi for complete information)

 Beautiful design, captivating performance and progressive technology come together in the all-electric Audi e-tron GT

May

- With launch control and overboost, the etron GT produces up to 522 horsepower; the RS e-tron GT distributes up to 637 horsepower to all four wheels
- The 2022 Audi e-tron GT is expected to go on sale in the U.S. this summer

HERNDON, Va., Feb. 9, 2021 – Looking every bit a concept car brought to reality, the 2022 Audi e-tron GT is a dynamic work of art. Long, low, wide, and exhilarating, it is a grand turismo that further expands Audi's prominent role in electric mobility.

Its classically beautiful design proportions are accentuated by large wheels, a wide track, and long wheelbase – lower and wider than the Audi A7 while maintaining approximately the same length. Aesthetics arise from efficiency; an inverted Singleframe grille reinterprets honeycomb design elements, distinctive quattro blisters above each wheel, and a flat greenhouse with sloping roofline define e-tron GT design. Coupled with radiator and brake duct air inlets that can close when not needed to optimize aerodynamics, drag coefficient is a low 0.24, helping the e-tron GT move with efficiency in complement with its velocity.

#### Other design highlights:

- U.S. models will come to market with standard 20-inch 5-double-spoke alloy wheels with gray accents; vehicles equipped with the performance package have 20-inch 5-double-spoke alloy wheels with black accents; the RS e-tron GT comes with standard 20-inch 5-spoke AERO wheels or available 21-inch wheels
- Standard for RS e-tron GT models is a lightweight, high-strength, five-layer carbon fiber reinforced plastic roof a first for an Audi vehicle and a segment-exclusive feature
- Available HD Matrix-design headlights with Audi laser light for greater high-beam visibility
- Strongly chiseled lower doorsill lines that emphasizes the battery pack as the car's powerhouse
   and foundation
- Inside, standard is a leather-free interior featuring recycled materials; Dinamica® and Alcantara come standard; Nappa leather is available
- The "monoposto" cockpit angles the 12.3-inch Audi virtual cockpit and 10.1-inch MMI touch response displays toward the driver
- Standard is a full-circumference, flat-bottom steering wheel, wrapped in Alcantara; a perforated, leather-wrapped steering wheel and capacitive hands-on detection are available



Intelligent performance - The Audi e-tron GT is defined by its duality: A high-performance gran turismo that can be just as easily driven spiritedly as it can be in leisure. The Audi RS e-tron GT, the first EV from Audi Sport sold in the U.S., expands this dual personality. Key to this characteristic are its electric propulsion system, three-chamber air suspension, all-wheel steering, and two-speed transmission.

**Permanent excitement -** An element of performance the Audi e-tron GT shares with the world's most thrilling roller coasters also contributes to its exhilarating performance: permanently excited magnets. Found in both the front and rear axles of the e-tron GT and RS e-tron GT, permanently excited synchronous motors (PSM) are ideal for the e-tron GT thanks to the motors' ample, instant torque from a standstill. The e-tron GT produces 235 horsepower at its front motor and 429 horsepower at its rear motor. The motors' net combined output is 469 horsepower, or up to 522 horsepower with overboost for 2.5 seconds with launch control, and 464 lb-ft of torque (472 lb-ft with overboost). This allows the e-tron GT to repeatedly accelerate from 0-60 mph in 3.9 seconds on the way to a top track speed of 152 mph.

The RS e-tron GT shares its front motor with the entry e-tron GT but has a more powerful rear motor, capable of producing 450 horsepower. Together, the front and rear motors in the RS e-tron GT produce a net 590 horsepower and up to 637 horsepower with overboost. Total system torque is 612 lb-ft. As a result, the RS e-tron GT can accelerate from 0-60 mph in 3.1 seconds and has a 155 mph top track speed. That places the acceleration of RS e-tron GT on par with the V10-powered Audi R8 supercar – all while generating zero direct emissions.



A unique feature in contrast to much of the Audi electric grand tourer's competition is its two-speed transmission, providing the e-tron GT with rapid acceleration when it is needed and a taller second gear for sustained highway stretches. \*Net combined horsepower and torque ratings according to SAE calculations.

- Air apparent The Audi e-tron GT comes standard with a three-chamber air suspension...
- Turning point Available in all e-tron GT models, all-wheel steering provides a maximum of 2.8 degrees in the rear – in the opposite direction up to a speed of around 30 mph to increase low-speed agility, and in the same direction above approximately 30 mph to aid stability at speed.
- Battery and charging All Audi e-tron GT models in the U.S. will benefit from a 93.4 kWh lithium-ion battery pack...
- **Precision and quality** Uncompromisingly high-quality, the Audi e-tron GT and RS e-tron GT models are assembled in the Böllinger Höfe plant alongside the Audi R8 supercar.

May







Marc Font CAE Passive Safety Engineer en Applus+ IDIADA

## S2A and IDIADA join efforts to investigate aerodynamics of real-driving events



S2A and IDIADA are engaged in a collaborative research project to investigate aerodynamic drag in realdriving conditions, since the effect of traffic events and real wind is not taken into consideration in standard wind tunnel tests and Computational Field Dynamics (CFD) simulations.

S2A & IDIADA will characterize the flow-field in many driving events such as dense traffic, overtaking, crossing manoeuvres and crosswind, among others, and will analyse several fluid dynamic properties such as air speed, pressure, or turbulence intensity. The deep understanding of real airflows will allow S2A and IDIADA to design more realistic measuring techniques and reproduce such driving conditions more accurately in the wind tunnel as well as by CFD simulation.

The final goal of this investigation is not only to reproduce these real-driving conditions in the wind tunnel and on the computer, but also to understand the key importance of each one and propose an alternative air drag assessment method that averages their importance.

As a result of this joint research, both companies expect to help vehicle OEMs by providing more complete aerodynamic assessments.

May







#### Northrop Grumman Completes Successful First Flight of Japan's RQ-4B Global Hawk

SAN DIEGO – April 16, 2021 – Northrop Grumman Corporation (NYSE: NOC) successfully completed the first flight of Japan's RQ-4B Global Hawk on April 15, 2021 from Palmdale, California. With an unmatched combination of range, endurance, and payload capability, Global Hawk is the only platform that provides greater data collection flexibility than space or medium-altitude assets.

"The unarmed RQ-4B Global Hawk will provide Japan with on-demand intelligence, surveillance and reconnaissance information supporting the Japan Air Self-Defense Force's missions of protecting borders, monitoring threats and providing humanitarian assistance in times of need," said Jane Bishop, vice president and general manager, autonomous systems, Northrop Grumman. "This successful first flight is a significant milestone in delivering Global Hawk to our Japanese allies."

Global Hawk is the only high-altitude, long-endurance unmanned air vehicle (UAV) to deliver near realtime on demand data around the clock. Once fielded, Global Hawk will integrate with other Japanese intelligence assets, including ground-based command and control units. The capability will provide solutions to monitor and deter regional threats to ensure Japan has a highly effective national security posture well into the future.

Northrop Grumman's family of autonomous HALE systems, including Global Hawk, are a critical component of networked, global ISR collection for allied nations and mutual defense organizations around the world. Global Hawk collects ISR data that enables decision makers to act with the right information at the right time. When Japan's Global Hawk fleet is fully operational, it will be part of a growing list of allied nations operating high-altitude long-endurance UAV. The United States, Australia, NATO and Korea will all be operating versions of this vital national surveillance asset.

Northrop Grumman solves the toughest problems in space, aeronautics, defense and cyberspace to meet the ever-evolving needs of our customers worldwide. Our 97,000 employees define possible every day using science, technology and engineering to create and deliver advanced systems, products and services.

#### Aerospace <u>US Airforce</u> week in photos





Maj. Josh Gunderson, F-22 Raptor Demonstration Team commander and pilot, performs an aerial demonstration during the 2021 Cocoa Beach Airshow in Cocoa Beach, Fla., April 17, 2021. The F-22's combination of stealth, supercruise, maneuverability and integrated avionics, coupled with improved supportability, represents an exponential leap in warfighting capabilities. (U.S. Air Force photo by Tech. Sgt. Sergio A. Gamboa)



Airman 1st Class Kwari Jackson, 113th Aircraft Maintenance Squadron F-16 Fighting Falcon crew chief, performs preflight checks prior to departing for a mission during exercise Green Flag 21-06 at Nellis Air Force Base, Nev., April 15, 2021. The District of Columbia's 113th Aircraft Maintenance Squadron Airmen are responsible for aircraft maintenance including servicing, inspections, launch and recovery, and munitions loading. (U.S. Air Force photo by Airman First Class Zachary Rufus)



Special tactics operators assigned to the 321st Special Tactics Squadron tandem hoist into a CV-22B Osprey during a training exercise near RAF Mildenhall, United Kingdom, April 15, 2021. The 321st STS provides a quick reaction, rapidlydeployable force capable of establishing and providing positive control of the air-to-ground interface during special operations or conventional missions. (U.S. Air Force photo by Tech. Sgt. Westin Warburton)

58

## **Coffee & Gossip**

04/26/2021 - The baby squirrel loves his block of food. I'd probably hang on a block of oreo cookies like the little one hangs on to the block. He is on the left and, at times, blends into the ground. I feed them under the horse trailer for safety from hawks.







04/19/2020 - My squirrel is a civil engineer - he dug a tunnel under the fence! Anyway, it is guite a dirt mound. He must have used a lot of little squirrel buckets. I bet they had a line and just kept handing the bucket to the next squirrel.

> 04/12/2021 - Does that raven look like a cat to you? WHY is my Raven in the bobcat area? The bobcat is in the gulley watching the Raven eat his food! Does the Raven care? NOT! He just ate and flew away. So much for the idea of my space - your space.







#### PREVIOUS

#### **Coffee & Gossip**











I could say I took a picture of the Vulture landing, BUT he was actually drying off after a nice bath, while Dusty relaxed and watched Mr. Vulture splash water.

I like my little birds - they make the tree look pretty. SO, I thought OH what a nice peaceful morning, sitting on my porch having a cup of coffee. Then my Ravens were screaming and flying at a tree. Talk about birds going angry crazy! SO, it took me while to find why they were flying at the tree and MR. Owl who is NOT suppose to be in my front tree was hiding in the tree. He's supposed to be in the back tree NEVER in the front. WHY don't these animals listen to me?



FIRST - Please know Tiki is NOT in any pain, seems happy, and is evaluated with an in-office visit with his veterinarian every quarter.

This was actually my Tiki cognizant test - As you all know, Tiki, our little Maltese rescue is deaf, and missing one eye - vision in the other is about 90% blind. SO, I got him to follow us to the kitchen and while I was putting their food in their feed bowl's I had two dogs staring at me AND one staring at the refrigerator. BUT he did get to the kitchen, AND that is what counts in my book of cognizant. Then wherever he stands the magic food bowl appears right under his face. Tiki is obviously a magician. I advised the vet that although he gets confused and at times does not seem to be in reality, that with his magician powers he's doing fine.

Actually, thinking about it there are times I don't seem to be in reality talking to owls, bobcats, coyotes and long conversations with my horses. AND that ends our April gossip of WHAT is that woman doing retired, and is she really in reality?



	04/19 -H. I ee -		04/26 - E. Pettitt - <u>Visualising Vehicle</u> <u>Platoon Aerodynamics</u> <u>Using ICFD in LS-</u> <u>DYNA®</u> 04/12 - Simulation
	Random Vibration Fatigue Analysis Model Development from Explicit to Implicit in LS-DYNA®		Data Management from CAD to Results with LoCo and CAViT for Large Scale LS- DYNA® LEGO® Crash Models
	03-29 - M.S. Hamid - <u>A Simple Ejection</u> <u>Mitigation Device to</u> <u>Increase Survival of</u> <u>Standing Gunner</u>	<b>F</b>	03-22 - T. Fokylidis - <u>Performing DOE</u> <u>Studies in Occupant</u> <u>Protection Using</u> <u>BETA CAE Tools</u>
	03-15 - S. TAN - P <u>reliminary</u> <u>Assessment of</u> <u>Precast Reinforced</u> <u>Concrete Columns</u> <u>against Close-in Air</u> <u>Blast</u>		03-08 - K. Stielau - <u>Advanced</u> <u>Pedestrian Legform</u> <u>Impactor (aPLI)</u>
Case Shot Wad Powder Charge Brass head Primer	03-01 - S. Deng - <u>The</u> <u>Shotgun Pellets</u> <u>Interior Ballistics</u> <u>Analysis by Discrete</u> <u>Element Method</u> (DEM) of LS-DYNA®		02-15 - B. Khaled, - <u>Using *MAT_213 and</u> <u>*MAT_187 to</u> <u>PredictFailure in</u> <u>Unidirectional</u> <u>Composites</u>

## Tutorials FEANTM



All require numerous solver runs	04/26/2021 - K. Kayvantash - <u>DYNAmore Express:</u> <u>Real-Time Crash</u> <u>Simulation and</u> <u>Optimization via a</u> <u>ODYSSEE-LS-DYNA</u> <u>Coupling</u>		04/19/2021 - M. Schenke - DYNAmore Express: <u>Beyond FEA - Smoothed</u> <u>Particle Hydrodynamics</u> (SPH)
	04/12/2021 - BETA CAE - <u>A new HBM</u> <u>Articulation tool for</u> <u>positioning HBMs</u> <u>directly inside ANSA</u> <u>v21.1.0</u>		04/05/2021 - Oaysis - <u>Top Tip: Oasys</u> <u>REPORTER - reports and</u> <u>analysis results</u>
Ruffies City ChangQueg (RCCQ)  Ruffies City ChangQueg (RCCQ)  Ruffies City ChangQueg (RCCQ)  Ruffies City ChangQueg (RCCQ)  Ru	03/29/2021- B. Shao - Oaysis - Webinar - <u>LS-</u> <u>DYNA – Civil/Structural</u> <u>applications</u>	<ul> <li>Inclusive sum (1574) (2010 KU (Ultimate))</li> <li>Hole wash and Kuther aneagy to loc</li> </ul>	03/22/2021 - M. Schenke - DYNAmore Express: <u>Beyond FEA -</u> <u>Smoothed Particle</u> Hydrodynamics (SPH)
	03/15/2021 BETA CAE - <u>Casting: Working with</u> <u>Align Entities</u>	DYNAmore Webinar!	003/08/2021 - R. Schutzer - <u>Updates in</u> <u>the DYNAmore Nordic</u> <u>Post-Processing</u> <u>Python toolbox for LS-</u> <u>DYNA</u>
	3/01/2021 - Oasys- <u>Top</u> <u>Tip: Oasys T/HIS group</u> <u>curves and graphs</u>	LS-DYNA	2/15/2021 - Anders Jonsson (DYNAmore Nordic AB) - <u>Hints</u> <u>when switching from an</u> <u>explicit to an implicit</u> <u>deck</u>



CO CO	04-26-2021 - Siemens - <u>Podcast transcript – The</u> <u>Future Car transportation</u> <u>revolution episode 1</u>		04-19-2021 - Ansys - <u>Realize the Sustainable</u> <u>Promise of Hydrogen</u> <u>Combustion</u>
	04-12-2021 - Altair - <u>Altair Increases</u> <u>Productivity for</u> <u>Designers and Architects</u> <u>with Thea Render</u> <u>Version 3.0</u>	Inde Name     Inde Name     Inde Name       Stage 6     Inde Name     Inde Name       Stage 6     Inde Name     Inde Name       Stage 7     Inde Name     Inde Name	04-05-2021 - Elisa - D3view - <u>New Ranking Table</u> <u>Visualizer for Simlytiks®</u>
	03-29-2021 - G. Laird - Predictive - <u>CFD Virtual</u> <u>Prototyping Clean Air</u> and Free of Nasty Stuff		03-22-2021 - M. Sambaer - Siemens - <u>How to save time</u> in ADAS system development
	03-15-2021 - K. Loeffler - ANSYS - <u>Digital</u> <u>Technologies Move the</u> <u>Railway Industry Forward</u>		03/08/2021 - E. Kam - ESI - <u>Bridge the Gap Between</u> <u>Virtual and Real</u>

## Monthly News FEANTM



2	04/19/2020- For my customers who request two cups of coffee to go, I will click them together with magnets for easy carry out. I may have just started a new way to carry out items! We will call this week's coffee Magnetic Flavor (EWWW that sounded metallic tasting)
	In this simulation, several magnets are embedded in a soft laminate structure.
	04/12/2020- Well, below is for engineers and WAY too much for me to understand! SO, you trot off to YouTube, and I will hand you your LENZ Coffee flavor this week -as you pass me - this week's flavor is also a Lenz's experiment, so I am not telling you the taste, but it 's yummy!
9 0:17	LS-DYNA EM : Lenz's experiment
	Here, we reproduce an experiment from high school physics: a permanent magnet falls through a copper pipe.
	04/05/2020- Great simulation to go with a great cup of coffee. SO, we will have Non-exploding coffee and head on over to watch what happens under water with an explosion.
2:09	<u>LS-DYNA Sample Models No.179</u> - Lancemore - Simulation of Underwater Explosion near the floating steel structure with ALE method. (UNDEX numerical simulation)

#### **Previous**

#### **Monthly News FEANTM**





**03/29/2020-** First - NO bird was hurt in the simulation and all my ranch birds stay away from airports. So, that said, this week is coffee dedicated to birds - if you fly in it's free coffee. Wow, was that offer silly, since you obviously can't fly? Okay, feed the birds and you can have a free coffee. That's fair!

<u>LS-DYNA SPH : Bird strike on rotor fan</u> Bird Strike on Ti-6AI-4V Fan Blades using SPH. Inspired from the AWG ERIF Test Case 2.1



03/22/2020- Well, if you aren't an engineer, it looks like I am rolling out pastries - BUT if you are, then you know that it's a simulation of a resistive heating problem. Now for today's quiz: What did I think it looked like? (NO, not rolling a tire down a road, whoever yelled that does not get a free pastry today! or as my friend's daughter would say, "Whatever." <u>Resistive heating problem</u>

**03/15/2021** - I know I tend to do Covid information BUT it is very difficult to drink coffee wearing a mask. I do use a mask and just use a straw to drink coffee if I am out, never taking off my mask! SO we will have Laird Latte Coffee this week.

Predictive Engineering CFD Consulting Covid 19 Particulate and Virus Dispersion Simulation for C - The following slides show a sample of CFD projects that are related to dispersion and particulate flow modeling.

**03/08/2021** - Today we are having Arago coffee. At times I think the simulation resembles my brain! BUT I rather watch the vanilla swirl in my coffee. SO, off we go to watch the simulation.



<u>LS-DYNA EM : Arago's disk</u> - IA bar magnet is suspended above an aluminum disk. When the disk starts spinning, it will 'drag' the magnet and cause it to start spinning in the same direction albeit at a lower speed. The effect was discovered by François Arago in 1824.

**03/01/2021** - I like the simulations by Dr. Markus Kellermyer - they are helpful, and inspire simulation including what kids would find interesting. We are off to YouTube with our coffee flavor of the week Kellermeyer with a splash of hazeInut! HA! bet you thought it would be chocolate.

<u>An engineers perspective - episode 11</u> - Inspired by the children, simulation from the playroom! Which toy has the most aerodynamic? Motivation for young simulation talents!



65

#### **Monthly News FEANTM**



02/15/2021 - I like this simulation video because I can see the air flow AND it includes the engine! Many simulations only have airflow. That would be like airflow around my coffee cups but not showing the coffee! SO let's head on over, with our coffee, and watch the video.

Multiphysics Group -Air flow around Sedan Model (engine included)

2/08/2021 - First, the people in the crash had minimal ouchies (pics below) The car went airborne! I was watching our outside camera for the Amazon delivery and actually had to replay the video since it was really airborne when he flew up a large rock through the fence and landed in the yard!

This week, we will give thanks to AIRBAGS! Coffee-A-La-AirBag. Let's get started with the simulation of an airbag, and then two pics of the car airborne. All airbags deployed and did their job. The car went over a first curb with rebar, rocks, another curb with rebar, then up a sizeable slanted rock for lift-off - luckily missed that tree by a few feet and landed in my front yard.

The impact is frontal, on a rigid wall, with an initial velocity of 35 mph.













There are many excellent simulations, but for this month we chose the 2 below.

Among our criteria is that the simulation length is 10 seconds or longer. This area will not have tutorials.



## LS-DYNA FSI - Example Model of Shear Wall and Dam Break

**By - Nicolette Lewis** 



Simulation vs Real Test /Rear Underride Crash

By - Ameen Topa



#### All recipes are copyright to Latte & Grappa



#### Potato Balls

Portions: About 15/18 potato balls Time: 30 min. Difficulty: Low

When Elisabetta @lamagiadellespezie and Nicole @lemongrassandoliveoil invited me to participate in their column "A spice a month" I was really pleasantly surprised and happy to give my contribution to the collection.

My spice drawer is now famous on social media because I have a rich and maniacally tidy collection that ranges from powder to whole ones, stored in glass jars to prevent them from losing their fragrance: I still choose quite common spices, which I can use in the kitchen of every day, and above all I don't risk too exotic flavors because I know I wouldn't appreciate them. I also have all the dried herbs, which I use regularly to flavor my preparations, and I gladly follow the explanations that the girls publish monthly to tell about one or the other spice.

In short, when I got assigned with the nutmeg, I was happy!

The nutmeg that we know with its round shape and its brown color is the fruit of an Indonesian tree: externally it is covered with a coating called Mace, which in nature is red and when you buy it is dried, colored brown, and is more easily found in the form of powder.

Its aroma is very elegant: I always use it in béchamel sauce, in the mixture of meat for meatballs, in meat fillings for tortellini pasta and, inevitably, with mashed potatoes.

It softens and rounds the flavor, which immediately becomes recognizable: a potato puree without nutmeg is not finished, you feel that something is missing.

I chose to use it in these potato balls, which were an experiment but which will rightfully enter the list of unmissable appetizers or greedy main courses for dinners on the sofa in front of a movie. We have certainly eaten too many, here.



#### Ingredients

- · Potatoes, 4/5
- · Ham in a single slice, 50 g
- Grated Parmesan cheese, 20 g
- · Egg, 1
- · Chopped fresh parsley, to taste
- · Black pepper, salt
- · nutmeg
- · Breadcrumbs, just enough
- · Frying oil

#### Steps

- Wash the potatoes well in their skins, place them in a saucepan full of water and boil until they are tender to the heart.
- Drain, let them cool a little and then pass through a potato masher: you will need to obtain 350 g of mashed pulp.
- Cut the ham into very small cubes.
- Combine the crushed pulp, ham, parmesan, egg, parsley, salt and pepper, a generous grating of nutmeg: mix well, then with moistened hands form small meatballs (you will get from 15 to 18).
- Roll them well in breadcrumbs and fry them in plenty of vegetable oil for frying.
- Serve them hot!



You are now leaving Our Town FEA Not To Miss (Population - Virtual)

Please come back Real estate available

## Goodbye and Come Back Soon



Graphics Courtesy of Vecteezy