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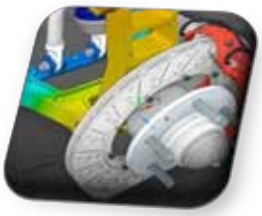

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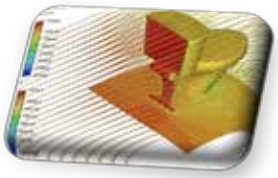


Art's Blog

LLNL

C&R by Corrado

Bringing a variety of FEA news, software solutions, and articles.

1st - Don't miss our article and sign up for the CADFEM Medical Conference

The FedScoop 50 Awards honor the best and the brightest who make the federal government more efficient and effective.

Vote For Joe - See below to find Joe on the Voting Page:

3rd Category from Top "Industry Leadership Section"
3rd Row, first picture is Joe Cole - Click on picture and VOTE!

I have some ranch gossip to share (well more like venting, well more like rant and rave)

That isn't fog! It's smoke coming toward the ranch - just drifting over everything at a quick pace.

First, all is okay, and we were spared the Mandatory Evacuation. We had the Warning Evacuation to be ready for the Mandatory Evacuation.

Last week wildfires were in our County (see LLNL article). I had an earthquake plan for evacuation but found out quickly that it wouldn't work for fire.

I have more than 2 horses but only a 2-horse trailer. For our earthquake evacuation plan we were not leaving the property. Ran into a lousy formula for fire evacuation: How to save things + what to take + where to put the horses for a chance of survival = you better have a fire plan. (fill in loud scream here).

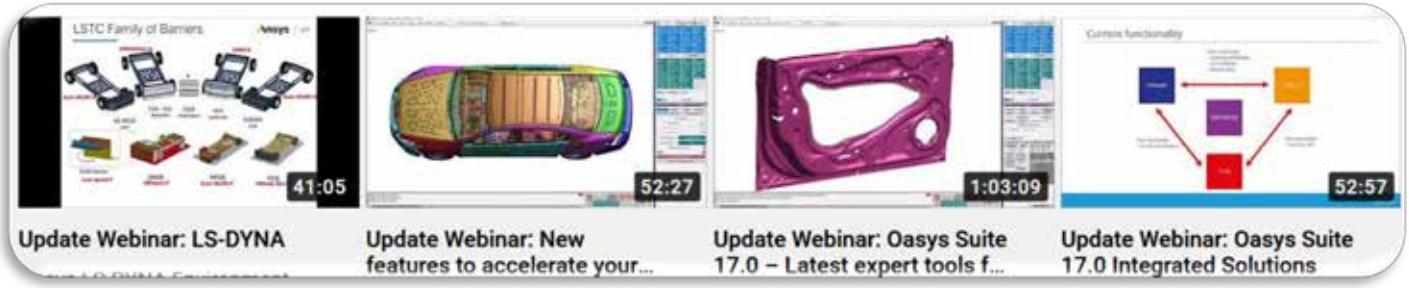
My immediate panicked plan? Trailer my 2 miniature horses with their portable pen to the LSTC parking lot, now owned by ANSYS. Leave a big note, "JENNIFER, I'll explain later to you, tell ANSYS please don't call animal control - be back later!" - Step 2: next, drive 3 dogs to John Hallquist at his new office building, and yell like a crazy woman, "John, putting these guys in my office, see you later" - race out the door back to the ranch. I'm now working on a better fire evacuation plan.

Editor Note: Oasys headquartered in the UK - LS-DYNA distributing and consulting also offers Uploaded Webinars for viewing

Marta Kempa, MBA • 1st
Marketing Coordinator, Oasys LS-DYNA Environment

Did you know that the August Newsletter is now posted on our website? Please visit our site and read the newsletter

Not To Miss on YouTube



Tutorials Available to Download - LS-DYNA PRIMER D3PLOT T/HIS REPORTER

Training: The Oasys & LS-DYNA training courses are back on!
We are offering our clients complimentary virtual spaces on Arup-delivered training courses.

The sessions will run on Microsoft Teams. Timing for each will be from 9:30 AM - 12:30 PM (BST).

Please register your interest on the following courses:

- 22,23,24 September Introduction to Oasys PRIMER
- 6,7,8 October Intro to Oasys POST
- 20,21, 22, and 27,28 Oct. Introduction to LS-DYNA
- 11 - 12 November - Oasys PRIMER: Seatbelt fitting and dummy positioning

The offer is provided on a first come first served basis.

We expect these to be popular so please register soon to guarantee a place!

Editor Note: The Medical Conference will take place OnLine - November 26, 2020

CADFEM MEDICAL CONFERENCE 2020

The CADFEM Medical Conference is the specialist conference for the application of simulation in the field of medicine and medical technology.

The Conference - It demonstrates lived practice and cross-divisional ideas and approaches in order to expand existing processes or process chains with the help of simulation, and to improve them in a sustainable way. The focus is on improved product safety, optimized therapies and diagnostic options, as well as simplified process flows in the area of development and approval.

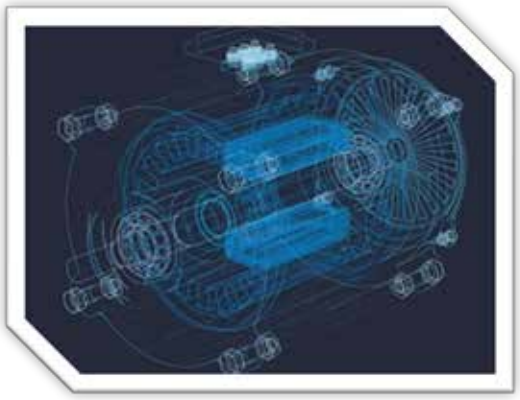
The Target Group: The CADFEM Medical Conference is aimed at decision-makers and innovation drivers. It connects CEOs, project managers, product managers, regulatory affairs managers, engineers as well as doctors, research institutions, notified bodies, and health insurance companies. This creates a unique platform for ideas and the exciting discussion about the future of simulation in medicine and medical technology.

The Program: The conference will open with a keynote speech. Two subsequent sessions with keynote speeches deal with innovative product examples from the medical technology industry, supplemented by contributions from representatives of notified bodies and health insurance companies that deal with the subject of approval and reimbursement of simulation-based diagnosis and therapy procedures. The subsequent panel discussion looks ahead, and with a critical eye, at the main theme of the conference: "The central role of in silico medicine - what it can do and what we need for its practice."

Speakers: Experience exciting and equally stimulating contributions from our first-class speakers from many areas of the MedTech industry and take the opportunity to exchange ideas with them. The list of speakers is constantly being expanded.

Among the speakers will be Dr. Thierry Marshal
Global Industry Director Healthcare, Consumer Product, Construction
ANSYS

Editor Note: **Excerpt - Full article is located and copyright to the Altair Blog .**



ModelCenter Simplifies Multidisciplinary Optimization of an Electric Motor for an Automobile

By Altair Partner Alliance on August 19, 2020

Guest authors – Scott Ragon, Ilya Tolchinsky, and Olivier Morisot from Phoenix Integration

Designing a modern electric motor for an electrified automobile requires striking the perfect balance between cost, weight, and performance. From a modeling and simulation standpoint, predicting the overall performance of the motor requires multiple multi-disciplinary analyses, including electromagnetic, thermal, and stress analyses.

The traditional computer aided engineering (CAE) process is simply not possible when the validation of the design requires this many models and types of solvers. This process consists of setting up a model, running the simulation, post-processing data, reviewing results, extracting the outputs of one simulation that are inputs into another, and iterating until an acceptable design is achieved.

ModelCenter's powerful integration capabilities provide engineers with the ability to quickly build automated multidisciplinary workflows. This enables the Altair Hyperworks™ software suite to be integrated in highly complex applications. In this example ModelCenter was used to solve the multidisciplinary problem of the design of an electric motor for an automobile and brought together electromagnetic, thermal, and structural performance criteria in a single workflow so that all the performance aspects and constraints can be simultaneously considered to design an efficient motor. The individual disciplines are evaluated using Altair solvers – Altair FluxMotor™ (initial baseline motor design), Altair Flux™ (EMAG), and Altair OptiStruct™ (thermal and stress analyses).

ModelCenter is a framework for model-based engineering and allows users to:

- Automate any modeling and simulation tool
- Integrate these tools together to create repeatable simulation workflows
- Set simulation parameters
- Automatically execute workflows
- Streamline the development of complex systems by connecting systems architecture and requirements to modeling and simulation tools

Editor Note: **Excerpt - Full article is located and copyright to the Altair Blog .**

The general design and optimization steps include:

1. Generate a baseline design using FluxMotor
2. Define the Design of Experiments (DoE) to explore the design space
3. Run the DoE (using Flux for EMAG, and OptiStruct for thermal and mechanical analyses)
4. From the results of the design space, create reduced order models that will replace the physics-based in the multi-disciplinary analyses so the workflow can be executed much faster, thus making optimization feasible
5. Set-up the optimization problem
6. Run the optimization problem to come up with the optimum design

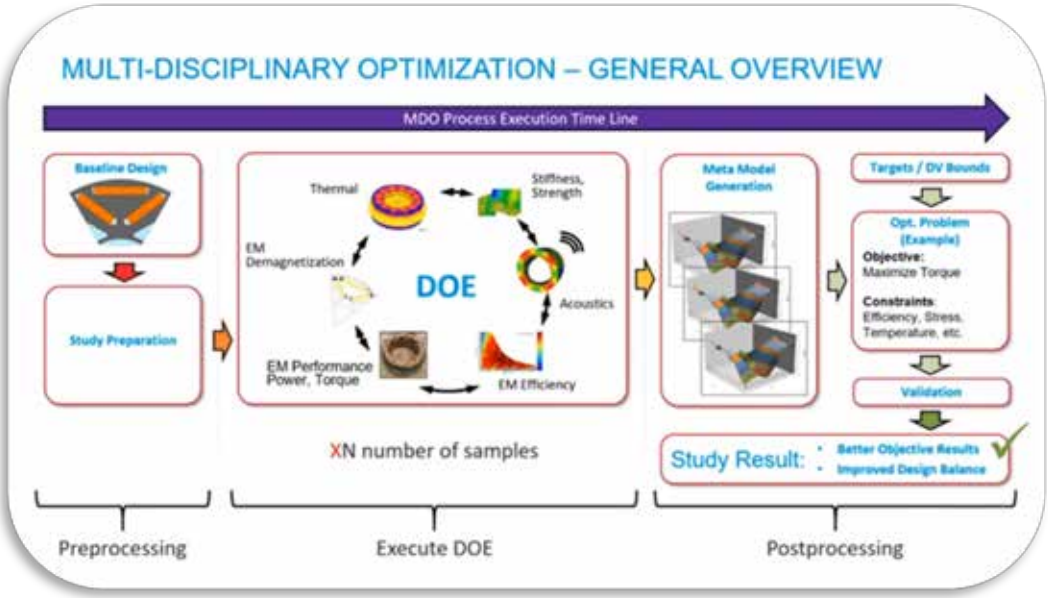


Diagram of the overall design and optimization process

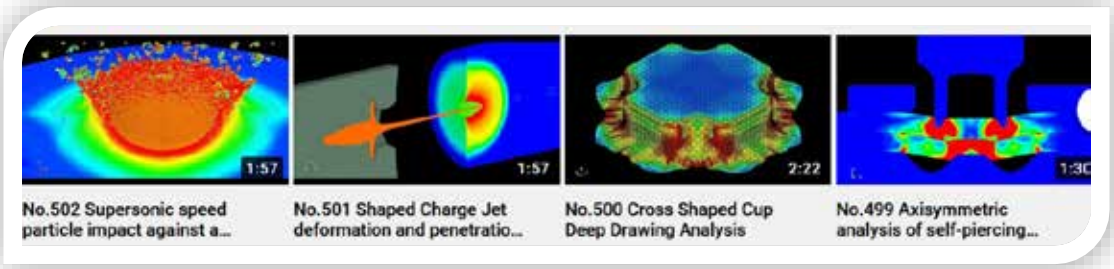
ModelCenter provides an easy way to connect the different analysis tools into a sophisticated workflow. Shown above is graphical representation of the workflow which makes clear the order of execution of the components and the data dependencies between them. When components do not depend on each other, it is possible to run them in parallel to reduce execution time. The workflow is executed by Altair HyperStudy™ to search through the design space and find the best answer.

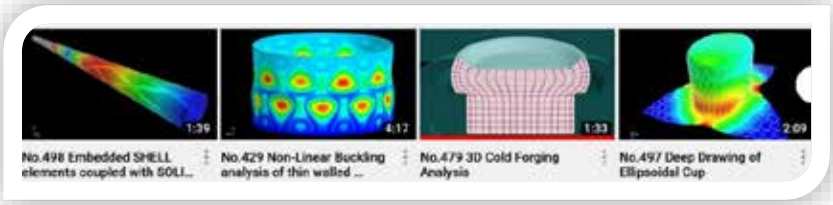
To continue reading the article please visit Altair Blog (links directly to article)

Editor Note: Lancemore does LS-DYNA analysis and consulting.

LANCEMORE Co., is one of the most advanced finite element analysis specialists in Japan, including analysis and consulting with LS-DYNA.

YouTube Channel - **Previous - Stay Tuned for October!**

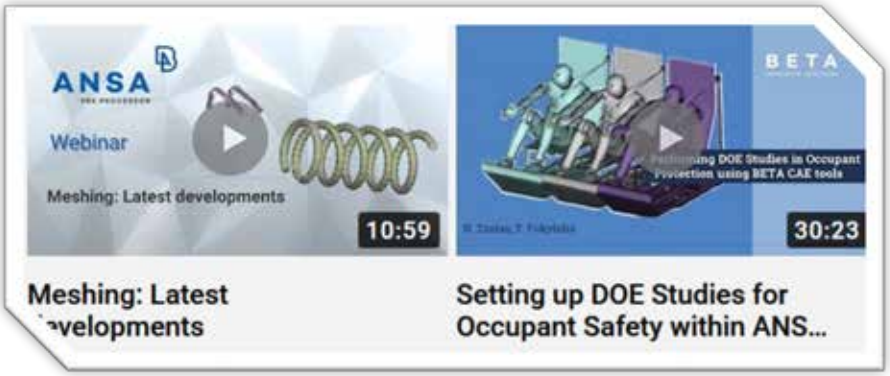




LancemoreJP YouTube Channel and Website

Editor Note: BETA CAE has a YouTube Channel with videos & webinars

Not To Miss on YouTube Channel



BETA CAE Systems YouTube Video Channel

Editor Note - MSC Software develops simulation software technology that enables engineers to validate and optimize their designs using virtual prototypes https://www.mscsoftware.com /

To get a complete and in-depth overview, please go to our website

Bhoomi Gadhia
Structures Product Marketing Manager at MSC Software

Generative design habit 7: Design for right first time
September 1, 2020 - by Gereon Deppe

We have finished our series of "The 7 habits of highly effective Generative Design".

Getting it right first time is not only important in physical manufacturing, but also in simulation as it is leaner and more efficient. Generative Design guarantees a highly fluent process, where the user can intervene and adapt the optimization model to find at least one final, optimal structure. These are characterized by organic shapes which are tailored for AM, and getting it right first time by focusing on manufacturability. Simulation of production with Digimat AM for polymers, and Simufact Additive for metals allows further tweaking for error-free production. The collaboration between the different software solutions makes it easy to achieve a production process that is entirely free of any costly incidents. An integrated workflow in product development is key to creating a successful and economic product.

MSC.Software YouTube Channel - Video - Webinars - Updates

Editor Note - Dynamore Express is part of DYNAmore Germany and DYNAmore Nordic information

DYNAmore Express - Your YouTube Channel for Learning

Ansys and DYNAmore Accelerate Passive Safety System Development at BMW

Ansys and DYNAmore support the rapid design and development of safe high-performance vehicles at BMW. Stuttgart/Munich, 10. August 2020

Together with its European Channel Partner DYNAmore, Ansys (NASDAQ: ANSS) is supplying the BMW Group with Ansys LS-DYNA for passive safety system development in the next generation of safe, high-performance vehicles. Ansys LS-DYNA empowers users to optimize the design and analysis of passive safety systems - supporting more accurate predictions of vehicle behavior during collisions.

Vehicles must undergo extensive and rigorous crash test scenarios during the design and development phases before they can be proven safe. As vehicles become more complex, the regulations for passing these tests become more stringent. Ansys empowers vehicle manufacturers with simulation tools with a high degree of fidelity to predict vehicle responses to these tests — speeding product and development cycles.

Ansys solutions support virtual crash testing by enabling engineers to optimize structural design for energy absorption during crashes and improve the interplay between different restraint systems, such as seatbelt tensioners and both front and side airbags. Ansys LS-DYNA users can implement a coherent, passive safety concept within a short development timeframe and with minimal use of hardware.

Editor Note - Dynamore Express is part of DYNAmore Germany and DYNAmore Nordic information

Ansys LS-DYNA is a highly scalable Multiphysics solver that simulates the behavior of most vehicle components as well as the complete vehicle within a fully coupled mathematical framework. LS-DYNA is scalable on high-performance parallel computer architectures, boasts an extensive range of material models, and facilitates rapid implementation of development requests.

"The thorough and in-depth analysis of the methods and algorithms in LS-DYNA initiated by the BMW Group was a very demanding project for us," says Ulrich Franz, Managing Director of DYNAmore. "The specific requirements of BMW Group with regards to the technical functionality and the integration into the existing processes and workflows were the main challenges that could only be met with great effort in all respects. DYNAmore works as an ongoing partner in software development, method development, user support and as an expert in materials science."

"Active and passive safety systems improve road safety and save lives by greatly reducing the risk of injury to occupants during unavoidable accidents. Following the successful acquisition of LSTC and integration of LS-DYNA into our product suites, Ansys' capabilities in this area are unmatched," said Shane Emswiler, senior vice president, Ansys. "Our many ongoing collaborations combined with our open-ecosystem and cutting-edge simulation solutions enable us to go one step further in the integration of passive and active security systems to meet the high demands of the automotive industry."

Editor Note - For full links please visit the ANSYS Blog or YouTube Channel

Curt Chan
Engineer | Technologist | Marketer

Have you tested out the all-new Ansys Discovery yet? Here are a few tips to help you get started!

Article by Justin Hendrickson/Article on ANSYS Blog

Editor Note - For full links please visit the ANSYS Blog or YouTube Channel

The 2020 FedScoop 50 Awards voting is now open!

Each year, the FedScoop 50 Awards honor the best and the brightest who make the federal government more efficient and effective. These awards allow us to celebrate the outstanding achievements of our peers and acknowledge their tireless efforts to make a positive impact in the government community and in public service.

- 3rd Category from Top "Industry Leadership Section"
- 3rd Row, first picture is Joe Cole - Click on picture and VOTE!

Editor: Art Shapiro About Art (pdf)

A Supercomputer Analyzed Covid-19 — and an Interesting New Theory Has Emerged

A closer look at the Bradykinin hypothesis
Thomas Smith

Summit is the second-fastest computer in the world

Earlier this summer, the Summit supercomputer at Oak Ridge National Lab in Tennessee set about crunching data on more than 40,000 genes from 17,000 genetic samples in an effort to better understand Covid-19. Summit is the second-fastest computer in the world, but the process — which involved analyzing 2.5 billion genetic combinations — still took more than a week.

When Summit was done, researchers analyzed the results. It was, in the words of Dr. Daniel Jacobson, lead researcher and chief scientist for computational systems biology at Oak Ridge, a “eureka moment.” The computer had revealed a new theory about how Covid-19 impacts the body: the bradykinin hypothesis. The hypothesis provides a model that explains many aspects of Covid-19, including some of its most bizarre symptoms. It also suggests 10-plus potential treatments, many of which are already FDA approved. Jacobson’s group published their results in a paper in the journal eLife in early July.

According to the team’s findings, a Covid-19 infection generally begins when the virus enters the body through ACE2 receptors in the nose, (The receptors, which the virus is known to target, are abundant there.) The virus then proceeds through the body, entering cells in other places where ACE2 is also present: the intestines, kidneys, and heart. This likely accounts for at least some of the disease’s cardiac and GI symptoms.

But once Covid-19 has established itself in the body, things start to get really interesting. According to Jacobson’s group, the data Summit analyzed shows that Covid-19 isn’t content to simply infect cells that already express lots of ACE2 receptors. Instead, it actively hijacks the body’s own systems, tricking it into upregulating ACE2 receptors in places where they’re usually expressed at low or medium levels, including the lungs.

In this sense, Covid-19 is like a burglar who slips in your unlocked second-floor window and starts to ransack your house. Once inside, though, they don’t just take your stuff — they also throw open all your doors and windows so their accomplices can rush in and help pillage more efficiently.

The renin–angiotensin system (RAS) controls many aspects of the circulatory system, including the body's levels of a chemical called bradykinin, which normally helps to regulate blood pressure. According to the team's analysis, when the virus tweaks the RAS, it causes the body's mechanisms for regulating bradykinin to go haywire. Bradykinin receptors are resensitized, and the body also stops effectively breaking down bradykinin. (ACE normally degrades bradykinin, but when the virus downregulates it, it can't do this as effectively.)

The end result, the researchers say, is to release a bradykinin storm — a massive, runaway buildup of bradykinin in the body. According to the bradykinin hypothesis, it's this storm that is ultimately responsible for many of Covid-19's deadly effects. Jacobson's team says in their paper that "the pathology of Covid-19 is likely the result of Bradykinin Storms rather than cytokine storms," which had been previously identified in Covid-19 patients, but that "the two may be intricately linked." Other papers had previously identified bradykinin storms as a possible cause of Covid-19's pathologies.

As bradykinin builds up in the body, it dramatically increases vascular permeability. In short, it makes your blood vessels leaky. This aligns with recent clinical data, which increasingly views Covid-19 primarily as a vascular disease, rather than a respiratory one. But Covid-19 still has a massive effect on the lungs. As blood vessels start to leak due to a bradykinin storm, the researchers say, the lungs can fill with fluid. Immune cells also leak out into the lungs, Jacobson's team found, causing inflammation.

And Covid-19 has another especially insidious trick. Through another pathway, the team's data shows, it increases production of hyaluronic acid (HLA) in the lungs. HLA is often used in soaps and lotions for its ability to absorb more than 1,000 times its weight in fluid. When it combines with fluid leaking into the lungs, the results are disastrous: It forms a hydrogel, which can fill the lungs in some patients. According to Jacobson, once this happens, "it's like trying to breathe through Jell-O."

This may explain why ventilators have proven less effective in treating advanced Covid-19 than doctors originally expected, based on experiences with other viruses. "It reaches a point where regardless of how much oxygen you pump in, it doesn't matter, because the alveoli in the lungs are filled with this hydrogel," Jacobson says. "The lungs become like a water balloon." Patients can suffocate even while receiving full breathing support.

The bradykinin hypothesis also extends to many of Covid-19's effects on the heart. About one in five hospitalized Covid-19 patients have damage to their hearts, even if they never had cardiac issues before. Some of this is likely due to the virus infecting the heart directly through its ACE2 receptors. But the RAS also controls aspects of cardiac contractions and blood pressure. According to the researchers, bradykinin storms could create arrhythmias and low blood pressure, which are often seen in Covid-19 patients.

The bradykinin hypothesis also accounts for Covid-19's neurological effects, which are some of the most surprising and concerning elements of the disease. These symptoms (which include dizziness, seizures, delirium, and stroke) are present in as many as half of hospitalized Covid-19 patients. According to Jacobson and his team, MRI studies in France revealed that many Covid-19 patients have evidence of leaky blood vessels in their brains.

Bradykinin — especially at high doses — can also lead to a breakdown of the blood-brain barrier. Under normal circumstances, this barrier acts as a filter between your brain and the rest of your circulatory system. It lets in the nutrients and small molecules that the brain needs to function, while keeping out toxins and pathogens and keeping the brain's internal environment tightly regulated.

If bradykinin storms cause the blood-brain barrier to break down, this could allow harmful cells and compounds into the brain, leading to inflammation, potential brain damage, and many of the neurological symptoms Covid-19 patients experience. Jacobson told me, "It is a reasonable hypothesis that many of the neurological symptoms in Covid-19 could be due to an excess of bradykinin. It has been reported that bradykinin would indeed be likely to increase the permeability of the blood-brain barrier. In addition, similar neurological symptoms have been observed in other diseases that result from an excess of bradykinin."

Increased bradykinin levels could also account for other common Covid-19 symptoms. ACE inhibitors — a class of drugs used to treat high blood pressure — have a similar effect on the RAS system as Covid-19, increasing bradykinin levels. In fact, Jacobson and his team note in their paper that "the virus… acts pharmacologically as an ACE inhibitor" — almost directly mirroring the actions of these drugs.

By acting like a natural ACE inhibitor, Covid-19 may be causing the same effects that hypertensive patients sometimes get when they take blood pressure–lowering drugs. ACE inhibitors are known to cause a dry cough and fatigue, two textbook symptoms of Covid-19. And they can potentially increase blood potassium levels, which has also been observed in Covid-19 patients. The similarities between ACE inhibitor side effects and Covid-19 symptoms strengthen the bradykinin hypothesis, the researchers say.

ACE inhibitors are also known to cause a loss of taste and smell. Jacobson stresses, though, that this symptom is more likely due to the virus "affecting the cells surrounding olfactory nerve cells" than the direct effects of bradykinin.

Though still an emerging theory, the bradykinin hypothesis explains several other of Covid-19's seemingly bizarre symptoms. Jacobson and his team speculate that leaky vasculature caused by bradykinin storms could be responsible for "Covid toes," a condition involving swollen, bruised toes that some Covid-19 patients experience. Bradykinin can also mess with the thyroid gland, which could produce the thyroid symptoms recently observed in some patients.

The bradykinin hypothesis could also explain some of the broader demographic patterns of the disease's spread. The researchers note that some aspects of the RAS system are sex-linked, with proteins for several receptors (such as one called TMSB4X) located on the X chromosome. This means that "women… would have twice the levels of this protein than men," a result borne out by the researchers' data. In their paper, Jacobson's team concludes that this "could explain the lower incidence of Covid-19 induced mortality in women." A genetic quirk of the RAS could be giving women extra protection against the disease.

The bradykinin hypothesis provides a model that "contributes to a better understanding of Covid-19" and "adds novelty to the existing literature," according to scientists Frank van de Veerdonk, Jos WM van der Meer, and Roger Little, who peer-reviewed the team's paper. It predicts nearly all the disease's symptoms, even ones (like bruises on the toes) that at first appear random, and further suggests new treatments for the disease.

As Jacobson and team point out, several drugs target aspects of the RAS and are already FDA approved to treat other conditions. They could arguably be applied to treating Covid-19 as well. Several, like danazol, stanozolol, and ecallantide, reduce bradykinin production and could potentially stop a deadly bradykinin storm. Others, like icatibant, reduce bradykinin signaling and could blunt its effects once it's already in the body.

Interestingly, Jacobson's team also suggests vitamin D as a potentially useful Covid-19 drug. The vitamin is involved in the RAS system and could prove helpful by reducing levels of another compound, known as REN. Again, this could stop potentially deadly bradykinin storms from forming. The researchers note that vitamin D has already been shown to help those with Covid-19. The vitamin is readily available over the counter, and around 20% of the population is deficient. If indeed the vitamin proves effective at reducing the severity of bradykinin storms, it could be an easy, relatively safe way to reduce the severity of the virus.

Other compounds could treat symptoms associated with bradykinin storms. Hymecromone, for example, could reduce hyaluronic acid levels, potentially stopping deadly hydrogels from forming in the lungs. And timbetasin could mimic the mechanism that the researchers believe protects women from more severe Covid-19 infections. All of these potential treatments are speculative, of course, and would need to be studied in a rigorous, controlled environment before their effectiveness could be determined and they could be used more broadly.

Covid-19 stands out for both the scale of its global impact and the apparent randomness of its many symptoms. Physicians have struggled to understand the disease and come up with a unified theory for how it works. Though as of yet unproven, the bradykinin hypothesis provides such a theory. And like all good hypotheses, it also provides specific, testable predictions — in this case, actual drugs that could provide relief to real patients.

The researchers are quick to point out that "the testing of any of these pharmaceutical interventions should be done in well-designed clinical trials." As to the next step in the process, Jacobson is clear: "We have to get this message out." His team's finding won't cure Covid-19. But if the treatments it points to pan out in the clinic, interventions guided by the bradykinin hypothesis could greatly reduce patients' suffering — and potentially save lives.

Editor: Art Shapiro About Art (pdf)

	**07/20/2020** - **Phalanx** - The Raytheon Phalanx Close-In Weapon System is a rapid-fire, computer-controlled, radar-guided gun system designed to defeat close-in air and surface threats. Spoiler alert: this is computer graphics arama3.com.
	**07/13/2020 - Cars in 1940 had about 15,000 parts and weighted 3,000 pounds. The B-24 Liberator Bomber had 450,000 parts, 360,000 rivets and weighed 18 tons**. Ford was up for the challenge and produced 1 aircraft per hour at the Willow Run assembly plant helping to win World War II.
	**06/29/2020 - An interesting article by By Peter Holderith who advises "The Chrysler Corporation (yes, the car company) used to have an aerospace department."**
	**06/22/2020 - A video created by minutephysics illustrates "The Astounding Physics of N95 Masks" It is informative and interesting to realize the physics behind the mask**
	**06/15/2020 - Lear Corp. created a Standard Operating Procedure (SOP) Covid-19 book for their company. It is comprehensive and can be used by many companies or as a starting point for you own SOP**

Editor Note: LLNL is Lawrence Livermore National Laboratory located in Livermore, CA
For this article pictures have been added from groups/sites following the fires

(pic by Kim Carpenter)

LLNL volunteers aid first responders during wildfire

When a severe lightning storm sparked what would become a conflagration consuming more than 390,000 acres and threatening the communities of Livermore and Pleasanton, volunteers with Lawrence Livermore National Laboratory's Community Emergency Response Team (CERT) answered the state's call for help.

Ignited by unusual summer thunderstorms in the early morning hours of Aug. 16, the blaze eventually dubbed the SCU Lightning Complex Fire quickly grew to burn portions of five counties, briefly shuttering LLNL's Site 300 and creeping within miles of the main Lab campus. Due to the massive size of the fire and its proximity to the Livermore area, on Aug. 19, Cal Fire, through the state's Office of Emergency Services, reached out to LLNL's CERT for assistance, as part of California's Emergency Mutual Aid agreement. It was the first time Cal Fire had called upon the Lab CERT team to respond to a major incident.

On Aug. 23, working with CalFire Incident Management Team No. 6, CERT members began reporting to the Cal Fire base camp at the Alameda County Fairgrounds in Pleasanton to staff the agency's fire information call center. For the next week, working six-hour shifts, including midnight and swing shifts, the more than 20 Lab volunteers answered hundreds of phone calls from concerned residents, providing them with updated information on evacuations, telling evacuees if and when they could return home and instructing them on relocating their livestock. Volunteers also helped with food delivery and training in support duties. By the end of the week, CERT members had worked a total of 57 shifts, including overnights, with many members volunteering more than 30 hours.

Part of the U.S. Federal Emergency Management Agency's CERT Program, the Lab's CERT team was established in 2013. It consists of about 60 volunteer employees from across the breadth of Lab directorates, ready at a moment's notice to support local first responders by offering immediate help to victims of disaster until professional emergency services arrive. Brad Bieck, fire inspector for Fire Protection in the Lab's Emergency Management Department (EMD), provides the group with FEMA-standardized classroom and hands-on training in basic search

Editor Note: LLNL is Lawrence Livermore National Laboratory located in Livermore, CA

and rescue, minor firefighting duties, fire safety, CPR and first aid skills, disaster psychology and incident stress. The training culminates in a large-scale disaster exercise.

Bieck, a retired firefighter who leads the LLNL CERT team, said the sheer scope of the SCU Complex Fire prompted Cal Fire officials to designate all local CERT teams as a necessary "key resource" to the wildfire response, putting out a call for all such units throughout Alameda County. For LLNL's CERT volunteers, it was the first time they had been asked to put their skills to the test outside the Lab.

"Our CERT team has never really had a disaster to respond to in the seven years we existed, and even though this was a horrible incident, it was a shot in the arm that they needed," Bieck said "These are people who want to help, they're ready to help and they're very capable. I think we can all be proud of our CERT team for stepping up and providing a vital key resource that the state needed."

On several days, Lab CERT volunteer Neil Elam awoke at 3 a.m. to carpool to his morning call center shifts, after which he would head to the Lab to work his day job as a maintenance supervisor for LLNL's Radioactive and Hazardous Waste Material department. Part of the original Lab CERT graduating class, Elam said he was "honored" to apply his training and work with professional fire and emergency crews to keep the public informed during a fast-moving and tragic situation.

"We have always had the heart to reach outside the fence if needed, so we were excited to be a part of this and provide a service to the community," Elam said. "We were nervous because even though we were just answering phones, we were tasked with giving people critical information on their safety. A lot of folks were ranchers and had livestock and were looking at possibly losing everything they had. It was intense; some of the stories really rocked us to the core. To me, that was a lot of responsibility, but I was happy to do it. It was an awesome experience."

Jenessa Dozhier, administrator for LLNL's Office of Strategic Diversity and Inclusion Programs, worked and home-schooled her children during the day and afterward volunteered in the call center from 6 p.m. to midnight. Dozhier said she "took great pride" in the fact that the Lab wasted no time in deploying its CERT team and felt like they accomplished their goals of aiding first responders and providing comfort in a disaster.

Editor Note: LLNL is Lawrence Livermore National Laboratory located in Livermore, CA

"When I trained to become a member of the LLNL CERT team it was my hope that I could do some good and help others in need," Dozhier said. "It was a wonderful feeling to hear the callers' stress levels come down as we worked through the call and provided them with information and guidance. Sometimes, more than anything, that's what people need in a time like that -- a friendly voice that can give answers, help people process their situation and calm down from the stress of an overwhelming situation. At the end of every call, the caller would thank us for helping them. It made it all worthwhile."

Engineering Directorate Senior Superintendent and CERT volunteer Randy Pico called the effort a "significant volunteer call-to-arms" for CERT members. Pico said while team members are granted unpaid time off to perform emergency duty, many used up vacation time to offer their support, with some members working back-to-back shifts and consecutive days.

"LLNL CERT members without a doubt aided and assisted an untold amount of people with much-needed information as countless people lived in fear from the threat of fire and thousands of structures were threatened," he said. "I'm just so proud to be a part of the CERT group; we truly made a difference."

The CERT team will continue staffing the call center as long as they are needed, possibly through mid-September. Cal Fire incident commanders and captains praised the team for their performance under pressure and thanked them for relieving some of the burden from the short-staffed firefighting units, many of which were overwhelmed by multiple large wildfires, by freeing them to put their full attention on suppression efforts. During the peak of the operation, the hotline received between 800 and 1,000 calls per hour and required 20 CERT members per shift to manage, according to acting EMD Head John Riley.

"I couldn't be prouder of their enthusiastic response," Riley said. "Victims who evacuated and residents who were warned of potential evacuation have called the county to express their appreciation for the excellent advice the teams provided. My management also expressed their appreciation, telling me that the dedication and commitment shown by our CERT volunteers reflects very favorably on the Lab."

Aaron Ward, the associate director of Infrastructure & Operations at LLNL, said the real-world experience the volunteers received in a disaster such as the SCU Complex Fire demonstrates the value of the training in the CERT program and how the skills and knowledge gained can be a benefit not just to the Lab, but the community at-large.

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"It's certainly something that reflects well, not only on them as individuals in volunteering their time, but us as a Laboratory," Ward said. "They're trained to a national standard that can be utilized and put into action anywhere that they go."

Other CERT volunteers aiding the SCU Fire response include Carlene Kiker, John Rolinson, Robert Caesarea "JR", Roberta LoGrande, Joel Bowers, Scott Fisher, Jeff Horning, Beth McCormick, Laura Phair, Lonnie Barragan, Mark Coons (Site 300), Michelle D'Hooge, Matt Pearson, Erik Brown, Mike Rushford, John Smalls, Krystal Lockwood (Site 300), Chad Hopponen (Site 300), Ed Duclair, Rene Castle, Lynda LoDestro, Aram Mashlakian, Nino Dungo, Jeff Fernandes, Steve Tanamachi, Kevin Ng and Chris Bishop.

For more information on the LLNL CERT team, or to find out how to join, contact Brad Bieck.

Editor Note: HBK (Hottinger, Brüel & Kjær), provider of integrated test, measurement, control, and simulation solutions for product performance evaluation.

Lawrence Grasty does not want you to miss this article on their website HBK, Making Bridges Last 100 years

Bridges can reach legendary ages – many viaducts and bridges from ancient and medieval times are still in use today. I wonder if the master builders back then ever imagined that their structure would last for thousands of years?

With modern bridges, things are a little different. All over the world, civil engineers are struggling with the increasing decay of bridge structures, which often don't survive 50 years.

Most countries now require that bridges should be designed and built to survive for 100 years. But how is that possible? How can you plan for the next 100 years?

According to Hallie Busta of 'Construction Inside Magazine', there are three major trends for making the bridges of the future as durable as possible:

1. A return to more robust construction
2. Improving the design processes
3. In-depth research and development in bridge technology

Bridge innovation lies in maintenance

This sounds logical at first glance – but it also shows that when we talk about the bridges of the future, we probably don't need to expect a revolutionary new technology or construction methods. The innovation of the future is finding new ways of managing and maintaining the bridge stock – this is also the assessment of the Spanish researcher Joan Ramon Casas in his article: The bridges of the future or the future of bridges?

And this is where we can quickly make the link to measurement and monitoring technology. After all, intelligent monitoring of bridges, for example, with the help of structural health monitoring applications, is playing an increasingly important role.

The trend is toward 'intelligent bridges' – intelligent, networked and even interwoven with the Internet of Things (see article on the topic).
The difference between static and dynamic testing

Of course, there are also many suitable metrological answers to the various questions and tasks in bridge monitoring. At HBK, with our specialist knowledge of many domains, we also cover many of these disciplines. For example, Brüel & Kjær has a wide range of products for structural dynamics measurements, which, for example, can easily be done using accelerometers, among others.

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Find out more about Brüel & Kjær structural dynamics at HBM products, which are more specialized in mechanical measurement quantities, are also used for numerous bridge monitoring applications. Optical Fiber Bragg (FBG) sensors are particularly popular due to their low signal losses over long distances. Click here for some exciting case studies on bridge monitoring.

And finally, Prenscia, also an HBK brand, has software that offers the possibility to use both dynamic and static measurement data perfectly.

When it comes to the difference between dynamic and static tests on bridges, this scientific paper from Piotr Olaszek and the already cited Joan Ramon Casas provide you with in-depth and comprehensible information on the subject.

This all shows that building bridges to last 100 years is not impossible. Sure, we will still make great progress in construction technology to make bridges generally more sustainable, but the progress made in monitoring and maintenance will give us much more confidence in the structural integrity of our existing bridges.

****

Additionally, Not To Miss:

Data Lake or Data Landfill?

by Jon Aldred
Director, Product Management at HBM Prenscia

Editor Note: Babak wanted to share a great video

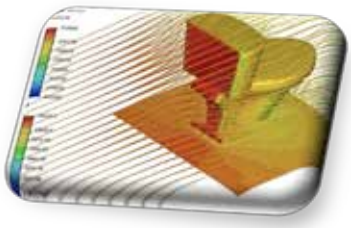
I came across this simulation of a LEGO model that was very interesting to watch

LS-DYNA Lego Crash from SCALE/DYNAmore 2019

DYNAmore GmbH did the below shown video. They compared it to a experimental LEGO model and it is shown in full detail in a 1hr video

DYNAmore Express: LEGO Crash Simulation in LS-DYNA - Data Management for Large-Scale Models

Editor Note: Rescale is a technology company that builds cloud software and services



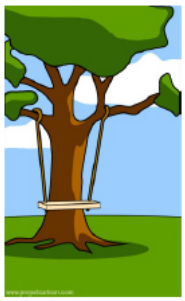
Excerpt from: [The Top 20 Best Engineering Memes, That Only Engineers Understand]

We are in the business of helping engineers. Whether they are working on new developments in supersonic flight or developing a pandemic ending vaccine, we are there to help. So we are always asking ourselves, what would make their lives better? How can we further help engineers?

That's when we had the idea that we should help relieve some of the stress that engineers face. And what better way then to make them LOL. So we went to work, curating a list of the best memes that only engineers understand. We dove head-first into a dangerously deep internet rabbit hole and resurfaced with the best the internet had to offer. We then surveyed hundreds of engineers on which memes were the most likely to help us achieve our goal.

The full list is located on their website

what the designer drew

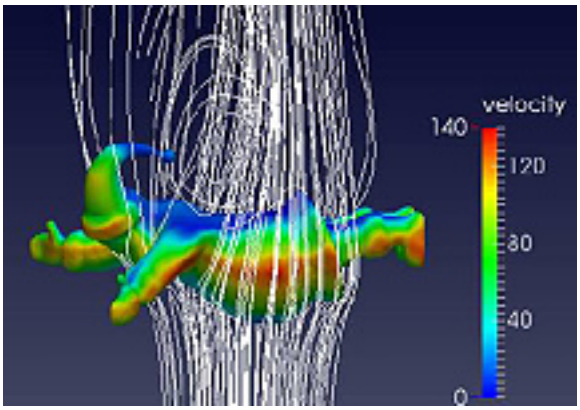


what the CAD jockey modeled

what the analyst analyzed

what got built

Aerodynamics of Santa



Learn with Crazy Engineers

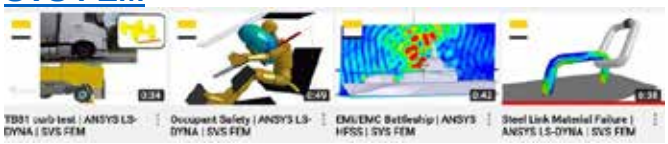
LS-DYNA Tutorial 6: Full modeling and numerical...

LS-DYNA Tutorial 6: How to make mesh models for...

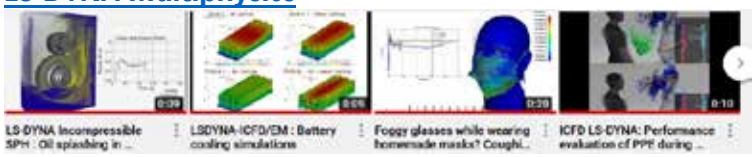
LS-DYNA Tutorial 6: 3D Surface Modeling for...

Previously Showcased

SVS FEM



LS-DYNA Multiphysics



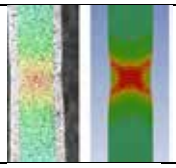
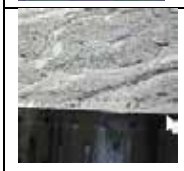
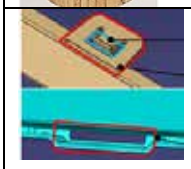
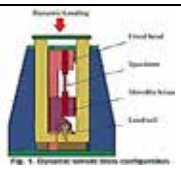
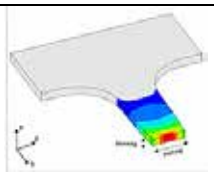
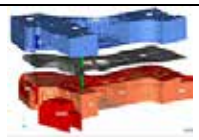
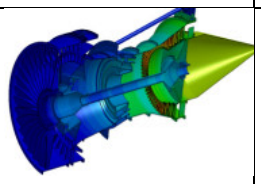
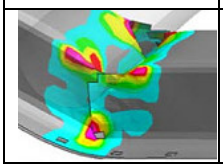
By Levity

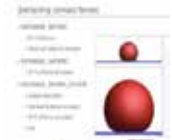
By DaveCADFEA

By Ameen Topa

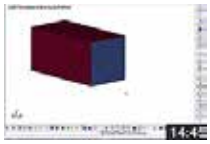
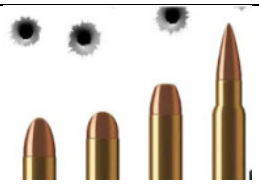
Dyna Forming Engineering & Technology DFETECH

Most Recent are located on the top rows of table

	H. Chen *ALE_STRUCTURED_FSIThe New S-ALE FSI Solver		S. Savaruai - A Full-Field Calibration Approach on Material Parameter Identification
	Chun Liu A Unified SPH-DEM-FEM Approach for Modelingof Debris Flow Impacts on Protective Structures		Katharina Stielau Advanced Pedestrian Legform Impactor (aPLI)
	**E. Irmak** - Modeling the Energy Absorption Characteristics of Wood Crash Elements		M.S. Hamid A Simple Ejection Mitigation Device to Increase Survival of Standing Gunner
	**N. Matsuura** - Development of Simple Connection Model for Plastic Parts in Low-Speed Crash Simulation		**H. Abdulhamid** - Ballistic Behaviour of UHMWPE Composite Material: Experimental Characterization and Numerical Simulation
	**B. Fröhlich - Virtual Testing of Curved Vehicle Restraint Systems**		**F. Andrade - A Hosford-Based Orthotropic Plasticity Model in LS-DYNA**
	**T. Tryland - A Simple Material Model for Composite Based on Elements with Realistic Stiffness**		**D. Sihling - Setting up a Hot Stamping Simulation considering Tool Heating with OpenForm**
	L. Benito Cia (GNS) - Airbag Folding for LS-DYNA using Generator4		G. Blankenhorn - Using a Rolls-Royce representative engine model to evaluate scalability of LS-DYNA thermal solvers
	K. Saito - A New Modelling for Damage Initiation and Propagation of Randomly-Oriented Thermoplastic Composites		M. Schill - Simulation of Sheet Metal Forming using Elastic Dies

	08/31/2020 - How to Accelerate Crash Analysis on Rescale with Ansys LS-Dyna		
 	08/24/2020 - Maruthi Kotti - Session 2 - Deciphering LS-DYNA Contact Algorithms 08/10/2020 - LYM - LS-DYNA Tutorial 3: Meshing Introduction (Method 1)	 	08/17/2020 - Thomas Borvall - DIEM and the No-Copy option in LS-DYNA 08/03/2020 - Faridzul Hilmi Shamsuddin - DFETech Modeling RC Column using LS-Prepost

Previous

	**07/27/2020 - Maruthi Kotti** - Oasys Ltd Session 1 - Deciphering LS DYNA Contact Algorithms		**07/20/2020 - DYNAmore** Setting up DOE Studies for Occupant Safety within ANSA and META
	**07/13/2020 - Kaizenat** Tutorial on LS-DYNA ICFD Flow Analysis		**07/06/2020 - Peter Reithofer** Modeling plastics in LS DYNA (Part 2) - Anisotropic Modelling of Thermoplastics
	**06/29/2020 Peter Reithofer** Modeling Plastics in LS DYNA - Isotropic Modelling of Thermoplastics		**06/22 - Ameen Topa** A short tutorial on how to generate solid mesh of a simplified bullet model from scratch.
	**06/15 - Gavin Newlands** Oasys Suite – Latest expert tools for LS-DYNA models		**06/08 - Filipe Andrade** MAT 024 Review of LS DYNA's popular material model
	06/01 - Martin Helbig Introduction to Material Characterization		

Editor Note - Marsha, our resident coffee drinker, is Editor of the guest Section.

08/31/2020 - Vantablack would make a great name for coffee. NO?

Okay, then read the real [Vantablack Optical Simulation: From Space to the Road](#) by Gwenaël Moysan, Guest Blogger Michael Stellmacher.

08/17/2020 - I'd like a Coffee Lake! I'd just get a long straw, sit on the shore and sip coffee for hours.

BUT not as interesting as what L. grasty shared by by Jon Aldred - [Data Lake or Data Landfill](#)

08/10/2020 - I think I need a coffee app. Everyone likes apps! I can have LS-Latte, LS-Vanilla, LS-Chocolate!

[Kaizenat](#)

08/03/2020 - I was thinking about better interior designs for my coffee cup, but then decided to read below.

ESI - Caroline Borot - [Aircraft Interior Design Just Got More Challenging](#)

07/20/2020 - I need to save time - Generative Design will help you save time. Me? I have to go back to grinding beans.

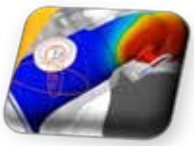
MSC.Software - [Gereon Deppe - Design for Exploration](#)

07/27/2020 - My coffee maker has visual block diagrams to make the coffee and save time. I wish!!

Altair - Peter Darnellon - [Real-Time Freedom for Motor Control Engineers](#)

07/06/2020 - Free coffee like Toyota. Not. But you can buy my coffee and they are offering THUMS!

Toyota - [Offers Free Access to THUMS Virtual Human Body Model Software](#)



07/13/2020 - Top 5 reasons for coffee? I like coffee! Below are 5 reasons for Discover.

ANSYS [- J. Hendrickson - The top-5-reasons to use ANSYS Discovery](#)

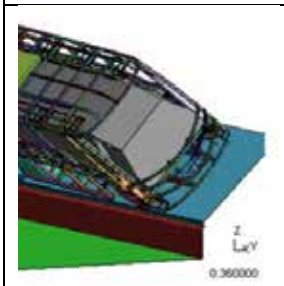
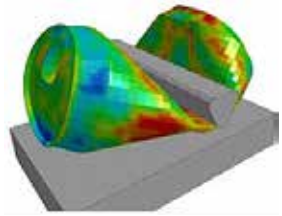
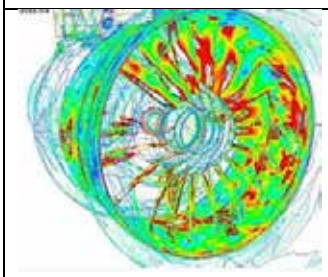
06/29/2020 - Marsha is intellectual - Okay all of you can stop laughing now!

G. Laird - [ITAR - Data Security For All Our Clients](#)

06/22/2020 - Response time of serving coffee is important but Man Bus is more important!

E. Kam - [ESI Talk - MAN Bus Reduces Response Time From Days to Hours](#)

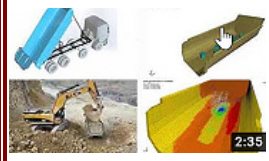
Editor Note - Our weekly website reviews, of course, with coffee references.

FIRE EVACUATION!!!	**Monday 08/24/2020 - No Posting today - We are in a fire zone with the California fires - but it is still distance. Today we did get our first "Warning Evacuation" call - I don't have time to post. We have to get the horses safe, in the arena so they have space if the fire hits the property, etc. We will stay until a "Mandatory Evacuation" notice and then by law we have to leave. I HATE FIRE!**
	**Monday 08/17/2020 - Good thing I have very strong lids on my coffee cups! Also good we aren't going to be in the below roll over! Off we go to YouTube!** **ECE R66 LS-Dyna Simulation**
	**Monday 08/10/2020 - Well, No one can complain about my coffee cups crushing like in the below video. That's why you should drink coffee in a cup, and not in a can!** **Soda Can Crush | ANSYS LS-DYNA |** **SVS FEM**
	**Monday 08/03/2020 - Well, I don't have any fan blades on the ranch that I can think of BUT that won't stop me from drinking coffee while we head over to LURI Engineering for their simulation and to drink their coffee!!** **Fan Blade Off Rig test Isosurfaces LURI Engineering**

FEANTM - Previous News

Editor Note - Our weekly website reviews, of course, with coffee references.

A few of my favorite past news



Monday 07/27/2020 - I SO love dump trucks! I can drive one and own one. Okay, believe that lie and I will try a few more. BUT I do really love trucks and pretend my small wheelbarrow is one when I dump the horse manure in the pasture. That sentence was actually the truth.

LS DYNA(4K) - Tipper Body | Mild steel vs Wear/High strength steel (HARDOX)

DaveCADFEA

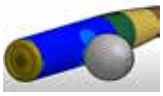
Monday 07/13/2020 - And it is coffee day! Well, to me, every day is coffee day. I can't have sloshing in any cup or the coffee pot. OH WAIT - let's take our coffee to YouTube and see their sloshing.

Tank slosh - LS-Dyna Coincident Node FSI

Vortex Engineering Group

Monday 06/29/2020 - We have wind turbines here in Livermore, CA SO in honor of that we are having Turbine Chocolate Coffee all day at no fee. (well, no fee was an exaggeration but the coffee is good)

Rotating wind turbine problem with sliding mesh using the incompressible LS



Monday 06/08/2020 - Gotta love Predictive Engineering with their video below. SO, that said we will serve this week CC - Conference Coffee!!! GO US! AND now let's go watch the video

ANSYS LST Conference 2020 LS-DYNA Exhibition Video - Predictive Engineering FEA Consulting Services

Monday 05/11/2020 -I just need to figure a mask with a straw through it where it is safe. Then I can have Mask Ala Mode Coffee flavor! I like it! NO, you can't use the straw for beer! It is only a coffee drinking idea.

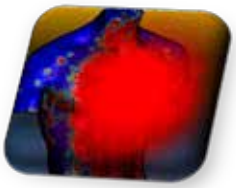
ICFD LS-DYNA: Coughing flow through porous commercial masks: FSI model adjustment around the face

FEANTM - Previous News - A few of my favorite past news

Editor Note - Our weekly website reviews, of course, with coffee references.

Monday 05/03/2020 - I'm not sure what I like most - lego's, dreaming that I own a Porsche, or dreaming of owning a Bugatti. Well since I can rule out owning a Porsche or Bugatti I will name this week's coffee Dreaming with a hint of mocha almond! I can afford Coffee - Life is good!

LS-DYNA® simulation vs. real LEGO® crash - Porsche (42056) vs. Bugatti (42083) view from left behind This video shows the crash of the Porsche and Bugatti LEGO® models from a view left behind.

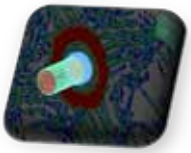


Monday 04/27/2020 - OUCH! Even watching this video makes me yell OUCH and hold my coffee cup up for protection. That will work - it is magical coffee called Kevlar repell with our chocolate magical repel blast spell.

Blast on human torso with SPH Method in the LS-DYNA -
Cihan SAVAŞ - Did you ever think that what would happen if blast on human torso is performed ?

Monday 04/06/2020 - AND this week's coffee is called, Pin Ball Wizard with chocolate! and MORE chocolate so grab that to go cup and let's go play!

Self-controlling pinball simulation using LS-DYNA - Sensors in LS-DYNA are used to activate or deactivate other entities, such as boundary conditions and contacts, during an ongoing simulation.



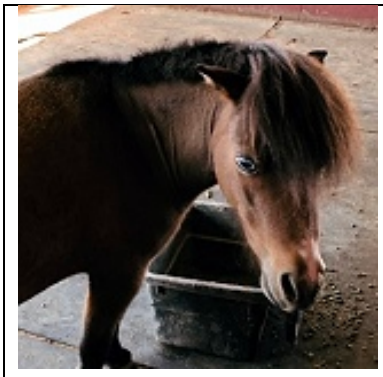
Monday 03/30/2020 - AND this week's coffee is called, Yuri with a hazlenut impact flavor! Grab that to go cup and we will head like a missle to YouTube. (oh stop groaning, I liked the missle reference)

Yuri Novozilov Simulation of a soft missile impact on reinforced concrete slab - Sugano impact test

Monday 02/17/2020 - I know where I don't want to be standing drinking my coffee! The simulation below is earthquake - All I can think of is RUN! Now, that is scary!

LS-DYNA Simulation of the collapse of Takiyya al Sulaymaniyya under earthquake loads has been done in LS-DYNA.

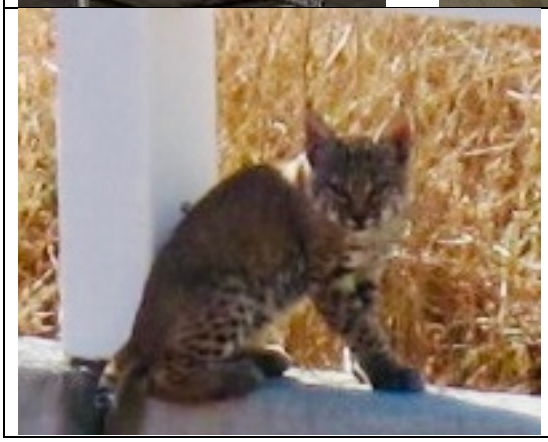
Coffee & Gossip By Marsha & Molly



08/31/2020 - Our miniature horse Dusty. He had such a long mane that we decided to give him a close cut mane cut. Now he wants it a rainbow color, BUT I said no!

08/17/2020 - Shane in his new see-through fly mask. Shane is now 28, and he seems to be having some vision difficulty with the older mesh fly masks. Anyway, here is a picture of Mr. Old and Grumpy (NO, not my husband) I meant the horse, Shane in his fly mask.

08/10/2020 - Okay, I have to admit I love my Raven family that lives here. They are such great parents - They groom the baby who is almost as big as them and still feed it, but it also eats on its own (I think). They love cat food, so I always put out some dry cat food and one can of food a night. Yes, only on small can since they can go find food! BUT, in case they don't, they have a backup with the rest of the birds.



08/03/2020 - WHY can't the bobcat take her kids to another location! Now the baby sits where Mom used to sit and watches me having coffee! Mom is more orange, so I guess the baby takes after his wandering Dad.

07/27/2020 - Do you know what it's like having coffee and the owl lands on the porch post, next to you? Then the owl looks at you like, "HEY, stopping to catch a lizard. You can just drink your coffee and ignore me." So, I ignored owl and drank my coffee and took a picture. Sure enough he started staring at something on the ground and jumped down off the porch onto the ground, then flew back to their nest. The scary thing I find with the owl is that I can't hear him at all. Like silent flying! Also I can't seem to get my ferals to respect my territory, their territory. It's like they all say, "Hey, Gramma, we need to borrow your space! Go drink coffee."

07/20/2020 - Owl Baby time! Or course Owl Baby has to sit above the bobcat play cavaletti's SO, we moved the play rails down a couple of yards. Then I was worried Mom Bobcat would catch it while it was asleep so I took my coffee and sat out there an hour until it flew up to the nest. AND look at those feet - it is going to be a big owl!

07/13/2020 - I am to mad to gossip. The bobcat AFTER I do all that babysitting ate my two favorite squirrels - well at least they are missing and actually so are all the bunnies and other squirrels.

07/06/2020 - Great, now I get to worry about baby bobcats. They are next to our house in a large garden area - They play, Mom stalks, they all catch things. I am beginning to feel like one big dysfunctional feral family. Not the best focused pictures but I stay on my side - they stay on theirs.

Baby

Mom Stalking Me

Mom sitting while I have coffee

Coffee & Recipes -September Shared Recipe

Italian Cuisine by Corrado Tumminelli ©

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Foreword - To reproduce a dish of Italian cuisine out of Italy is simple. It's sufficient to use exactly the listed ingredients (no substitutions, no changes, no additions) with the listed quantity, and to respect the listed cooking time.

Spaghetti with yogurt, peas and saffron

Serving: 2 - Total time: 45 min

Ingredients...

- 10-11 oz Red onion (300 grams)
- 10 tablespoons of Olive Oil (150 ml)
- 8 oz of Peas (deep frozen are ok) (240 grams)
- 1 cup of Water (220 ml)
- 1/2 cup of Yogurt (125 ml)
- 1/2 teaspoon of Saffron (dust) (0,25 grams)
- 6 1/2 oz of Spaghett (180 grams)

Pictures Left to right.

1. Chop the red onion in little pieces.
2. Get a little pot (around 6-7 inches), pour in the olive oil and the chopped onion.
   Cook at medium heat until the onion is almost transparent, not colored.
   To avoid burning the onion add a little water.
3. The final onion should be transparent, not colored.

Now for the spaghetti & the peas: Put 3 gallons of water in a pot and add a pinch of salt. When the water is boiling, not before, add the spaghetti.

Now add the peas to the cooked onions and the listed cup of water. Let cook at medium heat 3-4 min. See how fluid the result has to be in the picture below. Add a good pinch of salt and stir.

Turn off the heat and wait the spaghetti.

	Notice how fluid the result is, when you have added the peas to the cooked onions.
	The pasta has to be"al dente", so quite hard. The only rule is: you have to taste. The ones that throw the pasta on a wall to evaluate the "perfect" cooking should be shot at sunrise. So, when the spaghetti is finished "al dente" drain them and pour in the pot with the peas.

On the next page you finish - and you are ready to enjoy

Now add the yogurt and the dust of saffron.

Energetically stir

Finished!!!

Serve & Enjoy.