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Top 10 risk and compliance related news stories and world events that (for better or for worse) shaped the week's agenda, and what is next

Dear members and friends,

Proportionality in supervisory reporting is important for small and non-complex institutions. They report only a fraction of the number of data points of large banks, about ten times less, as a result of the proportionality built into the underlying legislation.

Now we have a new term, *enhanced proportionality*. I usually feel embarrassed when I see an adjective (like the word enhanced) before a legal term (like the word proportionality). I need to go back at square one to understand what proportionality is and what enhanced proportionality is now. So, I was not happy to read that the European Banking Authority (EBA) has just introduced *"enhanced proportionality in supervisory reporting"*.

We should expect that, of course. The EBA has recently published a report that sets out 25 recommendations to further *improve the significant proportionality* that already exists in the supervisory reporting.

The combined effect of the identified recommendations could reduce the reporting costs faced by up to 15-24%. For small and non-complex institutions this reflects savings in the range of EUR 188-288 million.

According to the recommendations, "the reporting experience will be more effective and efficient for both institutions and supervisors". *I do not understand how it is possible*. Reporting less details and less numbers can make the process cheaper, but definitely not better.

Dear EBA, I know what I will read in your reports after the next financial crisis, when the need for enhanced transparency will replace the need for enhanced proportionality

Read more at number 8 below. Welcome to the Top 10 list.

Best regards,

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Number 1

Report of the Analytical Task Force on the overlap between capital buffers and minimum requirements - December 2021

Executive summary

Capital buffers are key macroprudential policy instruments. Regulatory capital buffers ("the buffers") were introduced after the global financial crisis to mitigate systemic risk. Buffers help to ensure the resilience of banks and to conserve their capital by placing constraints on distributions if buffers are breached.

Unlike minimum requirements, buffers can be drawn down when losses have to be absorbed during times of stress and are replenished thereafter. Using buffers may thus cushion the financial cycle, especially in the case of the countercyclical capital buffer (CCyB), which is designed to be released by the authorities in a downturn.

Banks might not always be able or willing to use their buffers. For the purpose of this report, the "usability" of buffers and excess capital means that banks are able to deplete their buffers without triggering a breach any parallel minimum requirement.

The minimum requirements include the leverage ratio (LR), the minimum requirement for own funds and eligible liabilities (MREL) or the risk-weighted capital framework for the upcoming leverage ratio buffer for global systemically important institutions (G-SIIs), also referred to as the G-SII buffer.

Even if buffers are usable from this perspective, banks might be unwilling to use them. Banks' willingness to use buffers is beyond the scope of this report and may also depend on factors other than buffer usability.

However, investigations into banks' willingness to use buffers need to take into account potential regulatory impediments that might be an important reason why banks do not use buffers. Thus, both the ability and the willingness to use buffers may limit the capacity for buffers to cushion shocks.

When buffers overlap with parallel minimum requirements, buffer usability is inevitably constrained. EU banking regulation ("the banking package") establishes three parallel frameworks, each with minimum capital requirements:

(1) the risk-weighted capital requirements framework aimed at increasing the resilience of banks;

(2) the supplementary leverage ratio requirements constraining the build-up of leverage, mitigating the risk of destabilising deleveraging processes and safeguarding against model risk and measurement error; and

(3) the framework to facilitate the resolution of failed banks without putting public funds at risk.

These three frameworks apply simultaneously, with each of them playing an important role in contributing to the resilience of the banking system. However, the banking package also allows multiple uses of capital across these three frameworks, which in some instances includes the buffers.

Where this is the case, only those buffer resources that do not simultaneously count towards a parallel minimum requirement are usable. This report examines the usability and effective releasability of buffers by analysing the interaction between the combined buffer requirement (CBR), the upcoming G-SII leverage ratio buffer and the minimum requirements under each of the three frameworks.

The regulatory framework is multi-restrictive by construction. The different minimum requirements have different purposes and their combined effect is to achieve a more resilient banking sector.

Without such multi-restrictiveness, each individual requirement would have had to have been set at a higher level to achieve the same loss-absorbing capacity in terms of capital in the system, i.e. a minimum capital.

With minimum restrictions in many dimensions and rules that allow the multiple use of capital for buffers and minimum requirements across the frameworks, one consequence is that buffers may not always be fully usable for all banks.

The conceptual analysis below gives a stylised overview of how the regulatory interactions could limit buffer usability.

The driving factors in limited buffer usability are:

(i) the legal provisions laying down which equity and liabilities can be counted towards the different minimum requirements and buffers;

(ii) the relative size of the different requirements in nominal terms; and

(iii) a bank's balance-sheet structure. Relevant balance-sheet characteristics in this regard are the composition of assets and liabilities, the risk weight density of assets and the size of off-balance sheet items.

This report is the first to look at the interactions within the regulatory framework from a macroprudential perspective, where usability of buffers is an important precondition for effective policymaking. Macroprudential authorities may need to bear these interactions in mind when deciding on the calibration of macroprudential buffers.

The conceptual analysis also reveals that the regulatory system has become complex. While the leverage ratio and MREL have made the financial system more resilient and safer, their addition alongside the risk-weighted prudential framework has also increased complexity due to regulatory interactions.

This report is the first to conceptualise and empirically assess the interaction among the three parallel frameworks. Reducing this complexity and increasing transparency, where possible, could facilitate the understanding and analysis of buffer overlap by regulators and market participants alike.

Any potential changes to the EU regulatory framework should comply with international minimum standards.

Still, for the macroprudential framework to be effective, facilitating the usability of buffers within the multi-restrictive framework is important, not least when a macroprudential authority releases a buffer. The effectiveness of a buffer release depends on whether it translates into excess capital that banks can use to continue to provide credit to the real economy.

Banks drawing down released buffers are not subject to distribution restrictions as they would be if they breached buffer requirements. Under the current framework, the CCyB is intended to be released in a crisis.

A CCyB release is ineffective if the released capital is simultaneously tied up by a parallel minimum requirement. The same also holds true for any potential release of any other capital buffers.

Empirical analysis suggests that buffer usability could be limited in some EU Member States by the leverage ratio and may further decline once MREL rules apply. Depending on banks' portfolio adjustments in the years ahead, the analysis suggests that the usability of buffers may be considerably constrained for a material number of banks in several jurisdictions.

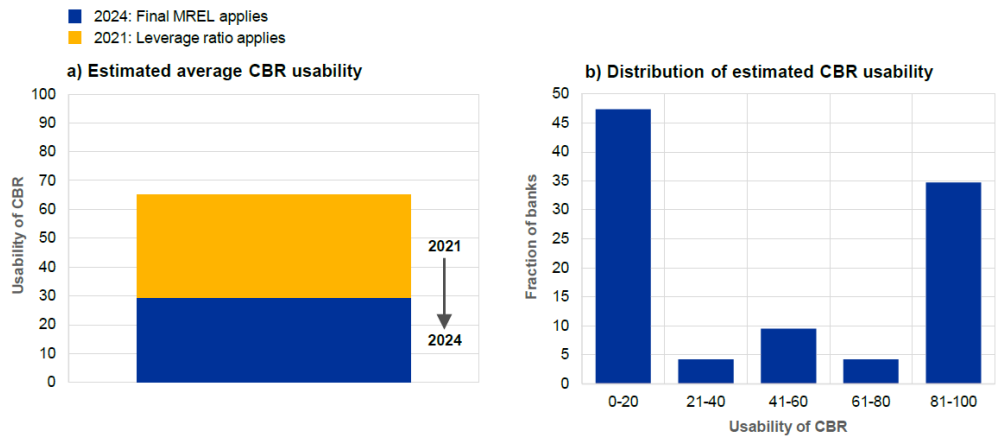
The analysis considers buffer usability from the perspective of CBR in the risk-weighted capital stack. This is a natural starting point for the assessment of impediments presented by parallel requirements.

The results show, however, substantial heterogeneity across regions, across countries and in particular across bank types. As regards regional and international heterogeneity, the leverage ratio tends to pose a greater constraint for buffer usability in western and northern European banks than in southern and central eastern Europe.

Chart 1

CBR usability – baseline scenario

(in percent)



Notes: In Panel A the usability of the CBR is weighted according to banks' nominal CBR. The baseline scenario assumes closed shortfalls and a minimum management buffer of at least 1% of risk-weighted assets in 2024 when the final MREL rules apply. Funding needs are assumed to be closed with the cheapest available funding source. Panel B shows the distribution of CBR

When the MREL is also factored in, aggregate buffer usability may decline further in all regions. Panel A in the chart shows the estimated average usability of the CBR in our baseline scenario. As regards bank heterogeneity, CBR usability varies significantly across banks (see Panel B).

Around one-third of the banks examined are estimated to have full or a very high level of CBR usability, but for more than half of the banks use of the CBR would seem to be substantially constrained if not totally impossible.

The report:
https://www.esrb.europa.eu/pub/pdf/reports/esrb.ATFreport211217_capitalbuffers~a1d4725ab0.en.pdf

Number 2

Staff Guidance

Form AP, Auditor Reporting of Certain Audit Participants, and Related Voluntary Audit Report Disclosure Under AS 3101, The Auditor's Report on an Audit of Financial Statements When the Auditor Expresses an Unqualified Opinion - Updated as of Dec. 17, 2021

A. Filing Requirements
1. General Requirements

General. Each registered public accounting firm must provide information about engagement partners and accounting firms that participate in audits of issuers by filing a Form AP, Auditor Reporting of Certain Audit Participants ("Form AP"), for each audit report issued by the firm for an issuer.

Form AP is due by the 35th day after the date the audit report is first included in a document filed with the Securities and Exchange Commission ("SEC" or "Commission"), subject to the shorter filing deadline that applies when the audit report is first included in a Securities Act registration statement (described below).

Example: A registered firm issues its audit report on the financial statements of Company A on February 28. Company A files its annual report on Form 10-K (the first SEC filing to include the audit report) on March 1. Form AP is due not later than April 5 (35 days after March 1).

Securities Act Registration Statements. If the audit report is first included in a registration statement filed with the SEC under the Securities Act, the firm is required to file Form AP by the 10th day after the date the audit report is first included in a document filed with the SEC.

Example—IPO: On March 20, Company B, an emerging growth company ("EGC"), confidentially submits a draft Securities Act registration statement for SEC staff review.

The firm is not required to file Form AP in connection with such a submission. On July 18, Company B files a Securities Act registration statement that is the first SEC filing to include the audit report on the financial statements.

The firm is required to file Form AP by July 28.

Example—Mutual Fund Formation: On June 6, a Securities Act registration statement is filed in connection with the formation of Fund C, an open-end mutual fund. The registration statement is the first SEC filing to include the audit report on the financial statements of Fund C. The firm is required to file Form AP by June 16.

Application of Filing Deadline in Other Circumstances.

Example—Contemporaneous Filing of Annual Report and Registration Statement: On March 1, Company D files both its annual report on Form 10-K, containing ABC Audit Firm's audit report, and a registration statement on Form S-3, incorporating the Form 10-K by reference.

Because of the incorporation by reference, the Form 10-K would be considered to be filed prior to the registration statement for purposes of Rule 3211 deadlines, and the filing deadline applicable to Form AP would be 35 days after the filing of Form 10-K, not 10 days after the filing of Form S-3.

Example—Reverse Merger: Company E, a shell company, acquires Operating Company X, a private company, on October 14 and files a current report on Form 8-K, including the audited financial statements of Operating Company X, on October 18.

There is no requirement for the auditor of Operating Company X to file Form AP in connection with the filing of Form 8-K because Operating Company X is not an issuer.

Form AP would be due in connection with the next filing of an audit report for Company E, for example, with the filing of Company E's annual report on Form 10-K.

The report:
https://pcaob-assets.azureedge.net/pcaob-dev/docs/default-source/standards/documents/2021-12-17-form-ap-staff-guidance.pdf?sfvrsn=52d4323d_4

Number 3

EIOPA analyses the use of limitations and exemptions from reporting under Solvency II

The European Insurance and Occupational Pensions Authority (EIOPA) published its annual report on the use of limitations and exemptions from the regular Solvency II reporting by national competent authorities (NCAs) during 2020 and the first quarter of 2021.

During 2020, three NCAs granted limitations and exemptions from reporting to 113 solo undertakings, while during the first quarter of 2021 there were 11 NCAs which granted limitations to 669 solo undertakings.

At group level, two NCAs granted limitations and exemptions from annual reporting to seven groups during 2020 and two NCAs granted exemptions to 27 groups for the quarterly reporting for the first quarter 2021.

In the first quarter 2021, large undertakings completed around 10 templates while on average five were submitted by smaller ones. Furthermore, regarding annual reporting the ten largest undertakings by total assets completed on average almost 37 templates, while the ten smallest undertakings completed only 28 templates.

The results show that proportionality is implemented in the reporting and reflects the nature, scale and complexity of the risks inherent to the business. The average number of templates submitted by small, medium-sized or large insurance undertakings varies substantially, which reflects that the proportionality embedded in the design of reporting requirements delivers a good result.

Background

The report is based on the Solvency II annual and quarterly quantitative reporting templates with reference during 2020 and the first quarter of 2021, as submitted to EIOPA by solo undertakings or insurance groups from the European Economic Area.

The limitation to regular supervisory reporting can be granted only to undertakings that don't represent more than 20% of a Member State's life, non-life insurance and reinsurance market respectively.

Supervisory authorities shall give priority to the smallest undertakings when determining the eligibility of the undertakings for those limitations.

For solo undertakings limitations can be authorised to submit quarterly reporting information of reduced scope, where this information is reported at least annually; while undertakings may be exempted from both quarterly and annual reporting in case of reporting templates on an item-by-item basis.

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The report:
https://www.eiopa.europa.eu/sites/default/files/publications/reports/report_on_limitations_and_exemptions_during_2020_and_q1_2021.pdf

Number 4

2021 Insurance Stress Test Report

In its fifth Union-wide stress test exercise, conducted in cooperation with the European Systemic Risk Board (ESRB), EIOPA tested the resilience of the European insurance industry against a prolonged COVID-19 scenario in a "lower for longer" interest rate environment.

The exercise covers a representative sample of 44 participants from 20 countries, representing 75% of the EEA market.

The scenario identified a set of market and insurance specific shocks specifically constructed to reflect the current EIOPA and ESRB assessment of prevailing systemic risks to the financial system.

These risks stem from the worsening of economic prospects, reflected in a global decline in long term risk-free interest rates from already historically low levels, accompanied by a material repricing of the risk premia amid weakening countries' fiscal positions and challenging corporate profitability.

An additional price correction in commercial and residential real estate completes the set of market shocks.

The diverging movements of the risk-free interest rate and of the risk premia qualifies the market scenario as a double-hit, potentially generating detrimental effects both on the liability side through the reduction of the discounting curves and on the asset side through the reduction of the prices of the relevant asset classes held by insurers in their investment portfolios.

The scenario embodies the characteristics of plausibility and severity required by a robust stress test exercise. The set of shocks are economically and market consistent, hence plausible, by construction.

While designed to test tail events, the overall likelihood of the market shocks of the scenario ranges between 0.1% and 0.6% as correlation moves from 0.35 to 0.824.

The market shocks are complemented by a set of insurance specific shocks affecting all the lines of business that are more exposed to the effects of the pandemic outbreak.

While maintaining its non pass-fail nature, the 2021 exercise has the primarily microprudential objective of assessing the capability of the participants to sustain the adverse conditions depicted in the stress test scenario.

The post-stress individual positions are eventually aggregated to infer the overall resilience of the insurance industry.

The 2021 insurance stress test enhances the macroprudential dimension of the exercise, complementing the standard fixed balance sheet approach with a constrained balance sheet approach where participants are allowed to apply reactive management actions in the calculation of their post-stress position. The results of these actions are used to identify potential spill-over effects on other markets.

The regular capital and solvency assessment, conducted in line with the Solvency II framework, is complemented for the first time by the assessment of the pre- and post-stress liquidity position of the participants over a 90 days' time-horizon.

The two components are based on a common narrative, scenario and set of shocks but are clearly separated in terms of the application of the shocks, data collection, assessment and disclosure.

The paper:
https://www.eiopa.europa.eu/sites/default/files/financial_stability/insurance_stress_test/insurance_stress_test_2021/eiopa-bos-21-552-2021-stress-test-report.pdf

Number 5

IFC Report No 14 - Sustainable finance data for central banks

2021 survey conducted by the Irving Fisher Committee on Central Bank Statistics (IFC), December 2021

Executive summary and recommendations

Public authorities in general and central banks in particular are paying more and more attention to sustainable finance, defined as the integration of a wide range of environmental, social and governance (ESG) aspects when making investment decisions.

This increased interest in sustainable finance reflects widespread concern about the impact of climate change, inequality and various factors that can undermine economic resilience, as highlighted recently by the Covid-19 pandemic.

Likewise, it is also a recognition of the special role that the financial sector can play in sustainable development, both directly through its own actions and indirectly through its financing of external activities.

In this context, the Irving Fisher Committee on Central Bank Statistics (IFC) conducted a survey on sustainable finance statistics among its members.

It received 63 answers, with detailed information provided by 28 advanced economies (AEs) and 31 emerging market economies (EMEs).

The purpose was to identify ESG data needs, availability and gaps from the perspective of the central banking community.

This work, organised in close coordination with other international statistical initiatives, led to the establishment of a list of almost 80 ESG metrics considered of particular relevance by central banks when pursuing their policy objectives.

The exercise was complemented by a stocktake of core documentation references on ESG data issues identified by IFC members, which is available as a complement to this Report on the IFC website.

One main message from the survey is that statistics on sustainable finance are in growing demand from central banks in pursuing their core mandates.

The primary focus is on green finance, as a means to limit carbon emissions and address climate change risks: a large number of IFC members are already facilitating stakeholders' awareness of the risks associated with climate change and of the need to decarbonise the economy.

Developing "green" capital markets and identifying sustainable investment are additional policy objectives reported in this context.

As a consequence, central banks have become crucial consumers of relevant sustainable finance data to support their policies, financial stability (including macroprudential policy as well as microprudential supervision for those central banks that are directly in charge of eg banking supervision), asset and reserve management activities, the conduct of monetary policy (including collateral policies) and financial inclusion measures, as well as specific in-house risk assessment and statistical exercises in the context of these policies.

A second insight is the abundance of data to be considered in the area of sustainable finance.

Of key importance are the indicators needed to properly support progress assessment, in particular on sustainable financial instruments as well as environmental indicators related to physical risk, emission trading and energy use pricing.

However, as many indicators are backward-looking, it is useful to complement them with forward-looking data to track commitments towards a greener economy.

Leading indicators considered useful by central banks in this context are climate target indicators, followed by indicators on firms' scenario analyses and on transformation and enabling efforts.

Yet, while these forward looking metrics have become a new area of focus, and many jurisdictions plan to use them, actual implementation work is often still lagging in practice.

A third lesson is that central banks are also making significant contributions to setting up statistical frameworks for sustainable finance; for instance, they have been instrumental in facilitating the development of green taxonomies.

They are also closely associated with other key stakeholders involved in climate-related data work, including government authorities (in the areas

of eg environment, finance and economic affairs), regulatory institutions and national statistical offices (NSOs).

The primary focus reported in the survey is on establishing statistical definitions, developing related taxonomies and conceptual work, setting up reporting requirements, and dealing with data quality aspects and confidentiality issues (including those related to the impact of technology innovation).

However, while the availability of green finance data is in general on the increase, there are substantial differences across jurisdictions.

In particular, a large number of AE central banks report that they already have in place standardised definitions and taxonomies (or are close to implementation), while such work is still at an early stage in many other jurisdictions, especially in EMEs.

This disparity reflects a number of factors, including the diversity of central banks' mandates as well as different implementation stages in terms of taxonomies, conceptual work, reporting requirements, and data quality/confidentiality management processes.

Unlike for environmental indicators, the use of social and governance indicators remains fairly limited, although central banks are gradually showing more interest in these areas too.

The social indicators that are deemed the most relevant relate to financial inclusion as well as working conditions and human rights.

As to governance indicators, transparency and disclosure on the one hand and board diversity on the other are considered to be top priority, mainly to support macroprudential supervision.

All in all, the survey results underline the growing recognition of the important role played by the large number of ESG data providers located outside the traditional perimeter of official statistics (such as commercial data providers as well as big data-based sources).

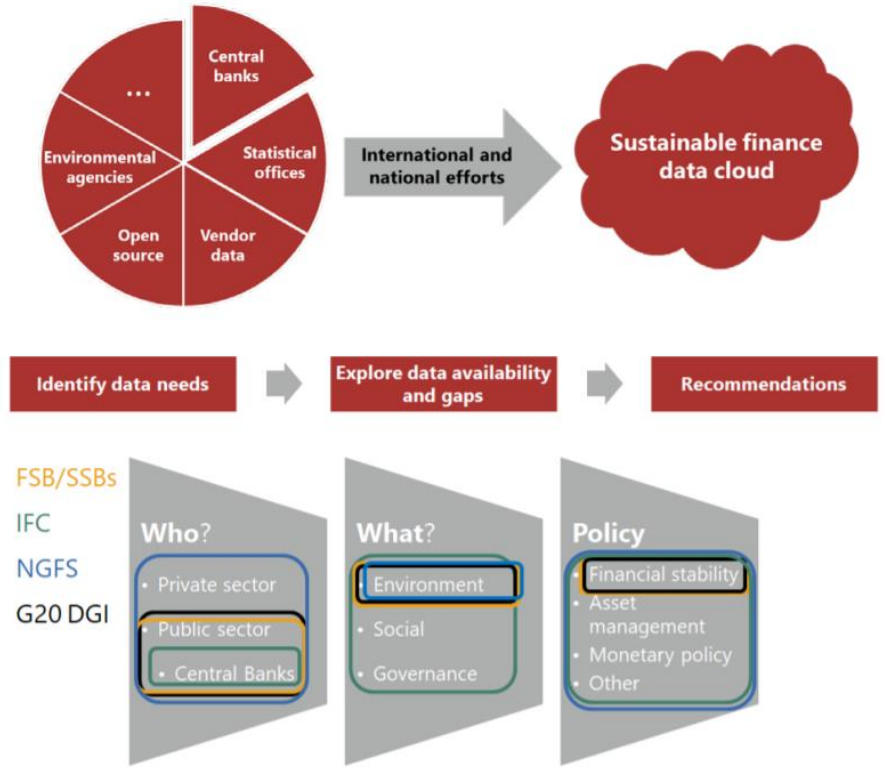
Hence, a key objective for central banks is to improve cooperation among the various stakeholders involved in sustainable finance data work.

Another goal is to support ongoing international statistical initiatives that aim at promoting a shared understanding of statistical needs (also by developing more unified taxonomies and regulations), developing conceptual aspects (eg how to assess financial stability risks arising from

climate change) and addressing the related operational aspects of data management (eg data quality assurance processes, reporting requirements, and dealing with confidentiality/privacy issues).

The report: https://www.bis.org/ifc/publ/ifc_report_14.pdf

Overview of international initiatives on sustainable finance data — Graph 1



Source: IFC Working Group.[3]

Number 6

The Double-Edged Sword of AI: Enabler of Disinformation

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Abstract

The tendency to consume news on social media platforms has greatly increased over the last decade. Information can now be disseminated quickly, cheaply, and with easy access for consumers; this has rapidly boosted decentralized news production, often without editorial oversight.

Adversarial agents are exploiting this situation to spread disinformation. Over the past ten years, the field of Artificial Intelligence (AI)/Machine Learning (ML) has experienced unprecedented growth in the development of applications for the automation of text, and the recognition and generation of visual and audio data.

Do these burgeoning AI capabilities boost the abilities of malicious actors to manipulate crowds? AI now plays a vital role in generating synthetic content and enables the efficient micro-targeting used on social media platforms to spread disinformation messages, including hyper-realistic synthetic images, videos, audios, and text.

This rather technical article has been written to inform practitioners, policymakers, and AI enthusiasts in NATO about how AI/ML technologies can be used to shape disinformation.

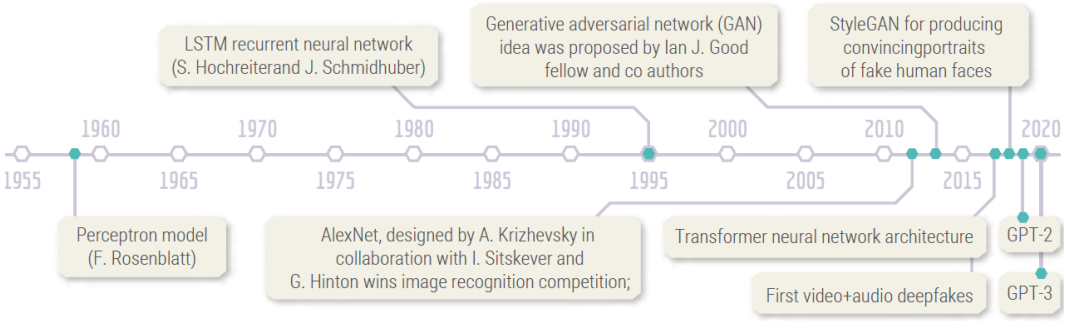

Figure 1. Some AI milestones relevant to the automated generation of disinformation content.

To read more:
https://stratcomcoe.org/publications/the-double-edged-sword-of-ai-enabler-of-disinformation/221

Number 7

Why vulnerabilities are like buses

How organisations can address the growing trend in which multiple vulnerabilities within a single product are exploited over a short period.

There's an old saying that you wait ages for a bus, and then several come at once.

A growing trend is the mass exploitation of a critical vulnerability in a product, followed shortly after by further critical vulnerabilities (and often 'in-the-wild' exploitation) in the same product. Organisations will have worked hard to push out-of-band patches for the initial vulnerability, only to have to repeat the process later when new vulnerabilities appear.

In this blog, we'll explore the factors driving this, and explain how organisations can better protect the software they've just patched from exploitation of future vulnerabilities.

Why does it happen?

A hostile actor looking for a usable vulnerability (or a security researcher identifying material for a publication or conference) only needs to find a single vulnerability in a product.

Once identified, the incentive to keep looking for others in the same product falls away. Products and services are very complex, and vendors or bug-bounty researchers are unlikely to find all the security flaws they contain.

When responding to a mass exploitation (or when vendors only have a fixed amount of time to address a flaw before an imposed deadline), they must focus on patching the immediate issue, rather than in-depth remediation of more fundamental flaws.

Fixing these underlying problems – hopefully – starts in parallel, but it can take months of work to retire or rewrite dangerous flaws in a product.

When a high-impact vulnerability is mass exploited and makes the news, it suggests the software contains other exploitable flaws. Security researchers or threat actors may then decide that it’s worth further research.

They might familiarize themselves with the technology and go on to find new security issues, which they then release to the vendor – or if their

intentions are malign, use as an exploit. This can lead to another wave of exploitation. In some cases, an organisation may not be affected in the first wave, but is later compromised when the second (or third) vulnerability appears.

Even if the vendor has made initial efforts to improve a product's security, it may still take longer to find and fix more fundamental issues than it takes threat actors – who have now smelt blood – to find and exploit them.

What can organisations do?

The rush to apply patches is unfortunately necessary once 'in-the-wild' exploitation is observed. The NCSC's advice remains for organisations to install security updates as soon as it's practicable.

However, in the immediate aftermath, defenders might consider how they can better protect the software they've just patched from future exploitation, when a patch isn't available or isn't yet applied.

An effective way to protect software is to reduce the attack surface by turning off or limiting software functionality.

This can include:

- turning off interfaces or protocols not in use
- where possible ensuring admin interfaces are not exposed to the internet
- disabling legacy components or settings
- upgrading or replacing legacy software where patches are no longer available
- restricting network traffic to and from the device
- reviewing authentication and authorisation for the device
- making sure future patching happens as soon as is practicable
-
- crucially, ensuring that the system isn't unpatchable in the first place.

Organisations can also use the case studies emerging from real-world vulnerability exploitations to consider whether their own monitoring

system would have detected activity on software and devices, and make adjustments where necessary.

Never let a good crisis go to waste

If considered strategically, the need to apply out-of-band patches in a high-pressure situation can give an organisation the required momentum to harden its internet-exposed software. This can help shift an organisation's security mindset from mostly reactive to more proactive, ultimately improving its fundamental network security.

A high-profile exploitation (such as the 'Proxyshell' issues in Microsoft Exchange Server mentioned earlier, or the current critical vulnerability affecting the Apache Log 4j 2 library) often brings considerable interest from an organisation's senior decision-makers.

This can then provide the impetus to secure the senior sponsorship and financial buy-in for slower, but equally important longer-term security projects, which might be harder to 'sell' in normal circumstances.

To read more:
https://www.ncsc.gov.uk/blog-post/why-vulnerabilities-are-like-buses

Number 8

The EBA introduces enhanced proportionality in supervisory reporting

- Reporting requirements for small institutions are significantly reduced in the area of additional liquidity monitoring metrics (ALMM) and asset encumbrance.

- The amendments to the reporting are a step forward in the implementation of the EBA's recommendations on cost reduction measures included in its study on the cost of compliance with supervisory reporting requirements.

- Additional amendments to the templates are proposed with the aim of implementing changes to regulatory requirements, streamlining reporting requirements, filling in data gaps and further clarifying the reporting instructions.

The European Banking Authority (EBA) published today its final draft Implementing Technical Standards (ITS) on supervisory reporting with respect to common reporting (COREP), asset encumbrance, global systemically important institutions (G-SIIs) and additional liquidity monitoring metrics (ALMM).

Proportionality was a key consideration in the proposed changes, making reporting requirements better suited to the size and risk of the institutions.

Following the recommendations of its cost of compliance Study, the EBA introduced the necessary amendments that will exempt small and non-complex institutions (SNCIs) from reporting several liquidity metrics, including the concentration of funding by product type, the funding price for various lengths of funding, information on roll-over of funding, as well as more granular data on asset encumbrance.

The EBA also implements simplifications for medium-sized institutions, which will be exempted from reporting liquidity metrics on roll-over of funding.

Besides enhancements to the proportionality of the reporting framework, the EBA also introduced some changes to reflect amendments to the prudential framework and bring the reporting up to date in the light of changing user needs.

The reporting on securitisation has been amended to implement the changes to the prudential requirements brought by the Capital Markets Recovery Package (CMRP).

With respect to the reporting on own funds and own funds requirements, the EBA introduced some minor amendments to obtain a deeper understanding of institutions' use of the option to exempt certain software assets from the deduction from own funds.

Furthermore, the definition of the level of asset encumbrance has been amended.

Regarding the reporting of information for identifying G-SIIs and assigning G-SII buffer rates, the EBA has expanded the scope of application of the reporting obligation, to include standalone entities that meet the relevant criteria, and not only banking groups.

To read more:
https://www.eba.europa.eu/eba-introduces-enhanced-proportionality-supervisory-reporting

Number 9

Mitigating Log4Shell and Other Log4j-Related Vulnerabilities

CISA, the Federal Bureau of Investigation (FBI), the National Security Agency (NSA), and the cybersecurity authorities of Australia, Canada, New Zealand, and the United Kingdom have released a joint Cybersecurity Advisory in response to multiple vulnerabilities in Apache's Log4j software library. You may visit: https://www.cisa.gov/uscert/ncas/alerts/aa21-356a

Technical Details

Log4Shell

Log4Shell, disclosed on December 10, 2021, is a remote code execution (RCE) vulnerability affecting Apache's Log4j library, versions 2.0-beta9 to 2.14.1. The vulnerabilit exists in the action the Java Naming and Directory Interface (JNDI) takes to resolve variables. Affected versions of Log4j contain JNDI features—such as message lookup substitution—that do not protect against adversary-controlled Lightweight Directory Access Protocol (LDAP), Domain Name System (DNS), and other JNDI-related endpoints.

An adversary can exploit Log4Shell by submitting a specially crafted request to a vulnerable system that causes that system to execute arbitrary code. The request allow the adversary to take full control over the system. The adversary can then steal information, launch ransomware, or conduct other malicious activity.

CVE-2021-45046

CVE-2021-45046, disclosed on December 13, 2021, enables a remote attacker to cause RCE, a denial-of-service (DoS) condition, or other effects in certain non-default configurations. This vulnerability affects all versions of Log4j from 2.0-beta9 through 2.12.1 and 2.13.0 through 2.15.0. In response, Apache released Log4j version 2.16.0 (Java 8).

CVE-2021- 45105

CVE-2021-45105, disclosed on December 16, 2021, enables a remote attacker to cause a DoS condition or other effects in certain non-default configurations. According t Apache, when the logging configuration uses a non-default Pattern Layout with a Context Lookup (for example, `$${ctx:loginId}`), attackers with control over Thread Context Map (MDC) input data can craft malicious input data that contains a recursive lookup, resulting in a `StackOverflowError` that will terminate the process. In response, Apache released Log4j version 2.17.0 (Java 8).

Impact

Log4Shell and CVE-2021-45046—rated as critical vulnerabilities by Apache—are severe because Java is used extensively across IT and OT platforms, they are easy to exploit, and applying mitigations is resource intensive. Log4Shell is especially critical because it allows malicious actors to remotely run code on vulnerable networks and take full control of systems.

According to public reporting, exploitation of Log4Shell began on or around December 1, 2021, and a proof-of-concept exploit is publicly available for this vulnerability. The FBI has observed attempted exploitation and widespread scanning of the Log4j vulnerability to gain access to networks to deploy cryptomining and botnet malware. The FBI assesses this vulnerability may be exploited by sophisticated cyber threat actors and incorporated into existing cyber criminal schemes that are looking to adopt increasingly sophisticated obfuscation techniques. According to public reporting, CVE-2021-45046 is being actively exploited as well.

CISA, the FBI, NSA, ACSC, CCCS, CERT NZ, NZ NCSC, and NCSC-UK assess that exploitation of these vulnerabilities, especially Log4Shell, is likely to increase and continue over an extended period. Given the severity of the vulnerabilities and likely increased exploitation, CISA, the FBI, NSA, ACSC, CCCS, CERT NZ, NZ NCSC, and NCSC-UK strongly urge all organizations to apply the recommendations in the Mitigations section to identify, mitigate, and update affected assets.

For more information on these vulnerabilities, see the Apache Log4j Security Vulnerabilities webpage.

Malicious cyber actors are actively scanning networks to potentially exploit CVE-2021-44228 (known as "Log4Shell"), CVE-2021-45046, and CVE-2021-45105 in vulnerable systems. According to public reporting, Log4Shell and CVE-2021-45046 are being actively exploited.

This advisory expands on CISA's previously published guidance, drafted in collaboration with industry members of CISA's Joint Cyber Defense Collaborative (JCDC), by detailing recommended steps that vendors and organizations with information technology, operational technology /industrial control systems, and cloud assets should take to respond to these vulnerabilities.

CISA, FBI, NSA, the Australian Cyber Security Centre (ACSC), the Canadian Centre for Cyber Security (CCCS), the Computer Emergency Response Team New Zealand (CERT NZ), the New Zealand National Cyber Security Centre (NZ NCSC), and the United Kingdom's National Cyber Security Centre (NCSC-UK) assess that exploitation of these vulnerabilities, especially Log4Shell, is likely to increase and continue over an extended period. CISA and its partners strongly urge all organizations to review AA21-356A: Mitigating Log4Shell and Other Log4j-Related Vulnerabilities for detailed mitigations.

You may visit:
https://www.cisa.gov/uscert/ncas/current-activity/2021/12/22/mitigating-log4shell-and-other-log4j-related-vulnerabilities

Number 10

From battling COVID-19 and cancer to searching for signs of ancient life on Mars, see Los Alamos' top stories from 2021

Despite the year's many challenges (and, in some cases, because of them), there were some incredible scientific and technological innovations out of Los Alamos in 2021. Here's a look back at just a few of them.

Mission to Mars!

Perseverance rover takes New Mexico to Mars

When NASA's Mars Perseverance rover touched down on the surface of Mars on Feb. 18, a bit of New Mexico landed along with it, thanks to work done at Los Alamos National Laboratory. Watch this video to learn about the rover's first two days on Mars.

New research shows that Mars did not dry up all at once

While attention has been focused on the Perseverance rover that landed on Mars last month, its predecessor Curiosity continues to explore the base of Mount Sharp on the Red Planet and is still making discoveries. Research published in the journal "Geology" shows that Mars had drier and wetter eras before drying up completely about 3 billion years ago.

First results from Perseverance mission show evidence of flash floods on Mars

New images from the Perseverance mission show evidence of delta and flood deposits in Jezero Crater on Mars, indicating that there were massive flash floods as well as periods of stability on the Red Planet. The deltas are an ideal place to search for signs of ancient life.

What does music sound like on Mars

The atmosphere is different on Mars, which means that sound travels differently. Watch this video to hear what music sounds like on Mars versus Earth!

Battling COVID-19

Vaccine development software shows promise in influenza effort, could help defeat coronavirus

A novel computer algorithm that could create a broadly reactive influenza vaccine for swine flu also offers a path toward a pan-influenza vaccine and possibly a pan-coronavirus vaccine as well, according to a new paper published in "Nature Communications."

Simulations reveal how dominant SARS-CoV-2 strain binds to host, succumbs to antibodies

Large-scale supercomputer simulations at the atomic level show that the dominant G form variant of the COVID-19-causing virus is more infectious partly because of its greater ability to readily bind to its target host receptor in the body, compared to other variants.

These research results from a Los Alamos National Laboratory–led team illuminate the mechanism of both infection by the G form and antibody resistance against it, which could help in future vaccine development. Watch this video to learn more.

Forecasting the spread of COVID

Los Alamos scientists used computer modeling to forecast the spread of COVID-19 through communities and help decision-makers determine which mitigation strategies were the most effective.

Moving toward a clean-energy future

Advancing fuel cell technology

The U.S. transportation industry is the nation's largest generator of greenhouse gases, accounting for nearly one-third of climate-warming emissions. To move towards a clean-energy future, developing zero-emissions technologies for heavy-duty vehicles is critical.

A new partnership comprising Los Alamos National Laboratory, Advent Technology Holdings Inc., Brookhaven National Laboratory, and the National Renewable Energy Laboratory (NREL) will work over the next few years to bring to market high-temperature proton exchange membrane (HT-PEM) fuel cells that convert hydrogen and other renewable fuels into electricity.

New fabrication method paves way to large-scale production of perovskite solar cells

A new, simpler solution for fabricating stable perovskite solar cells overcomes the key bottleneck to large-scale production and commercialization of this promising renewable-energy technology, which has remained tantalizingly out of reach for more than a decade.

Using climate science to assess our changing world

Freshwater outflow from Beaufort Sea could alter global climate patterns

The Beaufort Sea, the Arctic Ocean's largest freshwater reservoir, has increased its freshwater content by 40% over the last two decades, putting global climate patterns at risk. A rapid release of this freshwater into the Atlantic Ocean could wreak havoc on the delicate climate balance that dictates global climate.

Colorado River basin due for more frequent, intense hydroclimate events

In the vast Colorado River basin, climate change is driving extreme, interconnected events among earth-system elements such as weather and water. These events are becoming both more frequent and more intense and are best studied together, rather than in isolation, according to new research.

Antarctica remains the wild card for sea-level rise estimates through 2100

A massive collaborative research project covered in the journal "Nature" offers projections to the year 2100 of future sea-level rise from all sources of land ice, offering the most complete projections created to date.

Why arctic soil can go slip-sliding away

Slow-moving arctic soils form patterns that, from a distance, resemble those found in common fluids such as drips in paint and birthday cake icing. Los Alamos researchers and their collaborators analyzed existing arctic soil formations and compared them to viscous fluids, determining that there is a physical explanation for this pattern that is common to both Earth and Mars landscapes.

Studying climate change in the Arctic

In the Arctic, climate shifts are rapidly changing ecosystems, resulting in large feedbacks between snow, vegetation, and permafrost. Thicker snow leads to warmer permafrost because a deeper snowpack will insulate the ground from the frigid Arctic winter. Because shrubs tend to capture and hold snow, researchers find the warmest temperatures beneath the shrubs,

along with warming permafrost. In fact, underneath the shrubs and deep snow, windows — called taliks — into the permafrost will develop, allowing more water, energy, and nutrients to flow into the permafrost, speeding up the rate of warming and thawing.

Global warming, not just drought, drives bark beetles to kill more ponderosa pines

In California's Sierra Nevada, western pine beetle infestations amped up by global warming were found to kill 30% more ponderosa pine trees than the beetles do under drought alone. A new supercomputer modeling study hints at the grim prospect of future catastrophic tree die-offs and offers insights for mitigating the combined risk of wildfires and insect outbreaks.

How does climate change affect disease spread?

Climate change can make it easier for diseases to jump from animals to humans. Los Alamos National Laboratory researchers Andrew Bartlow, Jeanne Fair and Carrie Manore discuss the impact climate change has on infectious disease spread.

Understanding more about wildfires

Prescribed burns and other low-intensity fires are highly responsive to changes in winds

Scientists at Los Alamos National Laboratory and partners have used modeling to highlight the large impact that small changes in wind conditions can have on low-intensity fires or prescribed burns. Conducting safe prescribed fires depends on anticipating the range of potential fire behavior associated with complex wind conditions.

Probing wet fire smoke in clouds: Can water intensify the Earth's warming?

A first-of-its-kind instrument that samples smoke from megafires and scans humidity will help researchers better understand the scale and long-term impact of fires — specifically how far and high the smoke will travel; when and where it will rain; and whether the wet smoke will warm the climate by absorbing sunlight.

Understanding pyrocumulonimbi, aka 'fire clouds'

In recent years, megafires and their blanketing haze have become an increasingly familiar sight, along with the towering thunderheads of smoke

that form above them. Yet we're only beginning to learn what causes those awe-inspiring "fire clouds," what's in them and what effects they have on weather on climate. Through a combination of field observations, experimental work in the laboratory and computer modeling at local to global scales, our team at Los Alamos National Laboratory is making progress in understanding the mechanisms and climate impacts of pyrocumulonimbus from recent megafires in British Columbia (2017) and Australia (2019-2020).

Making strides in machine learning, AI

Machine learning blazes path to reliable near-term quantum computers

Using machine learning to develop algorithms that compensate for the crippling noise endemic on today's quantum computers offers a way to maximize their power for reliably performing actual tasks, according to a new paper.

Machine learning aids in simulating dynamics of interacting atoms

A revolutionary machine-learning (ML) approach to simulate the motions of atoms in materials such as aluminum is described in "Nature Communications" journal. This automated approach to "interatomic potential development" could transform the field of computational materials discovery.

New AI tool makes vast data streams intelligible and explainable

Making sense of vast streams of big data is getting easier, thanks to an artificial-intelligence tool developed at Los Alamos National Laboratory. SmartTensors sifts through millions of millions of bytes of diverse data to find the hidden features that matter, with significant implications from health care to national security, climate modeling to text mining, and many other fields.

New AI tool tracks evolution of COVID-19 conspiracy theories on social media

A new machine-learning program accurately identifies COVID-19-related conspiracy theories on social media and models how they evolved over time — a tool that could someday help public health officials combat misinformation online.

Machine learning model generates realistic seismic waveforms

A new machine-learning model that generates realistic seismic waveforms will reduce manual labor and improve earthquake detection, according to a study published recently in JGR Solid Earth.

Machine learning refines earthquake detection capabilities

Researchers at Los Alamos National Laboratory are applying machine learning algorithms to help interpret massive amounts of ground deformation data collected with Interferometric Synthetic Aperture Radar (InSAR) satellites; the new algorithms will improve earthquake detection.

Science, AI help unlock green energy in northwest New Mexico

A group of Navajo entrepreneurs in Tohatchi have had their eye on the business potential of an oil-exploration well drilled in the 1950s, but they're not considering fossil fuel production. The well produces water heated by hidden deep geologic processes. As a geothermal energy source, the well might help power the group's plans to create a long-term food-water-energy nexus on the Navajo Nation, stimulating the local economy while helping New Mexico transition to a carbon-free energy portfolio.

Exploring the next frontier of computing: Quantum

Lack of symmetry in qubits can't fix errors in quantum computing, but might explain matter/antimatter imbalance

A team of quantum theorists seeking to cure a basic problem with quantum annealing computers — they have to run at a relatively slow pace to operate properly — found something intriguing instead.

While probing how quantum annealers perform when operated faster than desired, the team unexpectedly discovered a new effect that may account for the imbalanced distribution of matter and antimatter in the universe and a novel approach to separating isotopes.

Software evaluates qubits, characterizes noise in quantum annealers

High-performance computer users in the market for a quantum annealing machine or looking for ways to get the most out of one they already have will benefit from a new, open-source software tool for evaluating these emerging platforms at the individual qubit level.

New quantum research gives insights into how quantum light can be mastered

A team of scientists at Los Alamos National Laboratory propose that modulated quantum metasurfaces can control all properties of photonic qubits, a breakthrough that could impact the fields of quantum information, communications, sensing and imaging, as well as energy and momentum harvesting. The results of their study were released yesterday in the journal "Physical Review Letters," published by the American Physical Society.

Quantum machine learning hits a limit

A new theorem from the field of quantum machine learning has poked a major hole in the accepted understanding about information scrambling. Watch this video to learn more.

Narrowing down the neutrino

Physics experiment boosts evidence for sterile neutrinos

Analysis of results from an experiment called MiniBooNE at Fermilab has provided yet more evidence that particles called “sterile neutrinos” could indeed exist, supporting results from a 1990s Los Alamos National Laboratory experiment that indicated an update to the Standard Model of physics might be in order.

Neutron measured with greatest-ever precision

The neutron, one of the three primary particles comprising everyday matter, was discovered in 1932. But despite all the advances in physics in the last 89 years, the exact life expectancy of the neutron has managed to remain elusive, even disputed.

An experiment at Los Alamos National Laboratory with twice the precision of previous efforts has now measured the neutron lifetime at 877.75 seconds, with record uncertainty of less than one-tenth of one percent.

Developed radioisotopes to fight cancer and diseases

Los Alamos generator system delivers large radiation doses directly to cancer cells

Improved options for cancer treatment are on the way, thanks to a new system developed at Los Alamos National Laboratory for producing alpha-emitting medical radioisotopes intended to target and overpower diseased tissue while sparing the healthy tissue around it.

Combating drug resistant infections with radioisotopes

Researchers at Los Alamos National Laboratory have developed a promising new approach for diagnosing and treating drug-resistant pathogenic microorganisms that uses bacteria-specific siderophores to convey a treatment molecule directly to a pathogen. Siderophores are "iron carriers," which are molecules produced by microorganisms such as fungi and bacteria that transport iron across cell membranes.

Answered questions about our galaxy

HAWC Gamma Ray Observatory discovers origin of highest-energy cosmic rays in the galaxy

A long-time question in astrophysics appears to finally be answered, thanks to a collection of large, high-tech water tanks on a mountainside in Mexico. The High-Altitude Water Cherenkov (HAWC) data shows that the highest-energy cosmic rays come not from supernovae, but from star clusters.

Boundary of heliosphere mapped for the first time

For the first time, the boundary of the heliosphere has been mapped, giving scientists a better understanding of how solar and interstellar winds interact. Watch this video to learn more.

3D simulations improve understanding of energetic-particle radiation and help protect space assets

A team of researchers used 3D particle simulations to model the acceleration of ions and electrons in a physical process called magnetic reconnection. The results could contribute to the understanding and forecasting of energetic particles released during magnetic reconnection, which could help protect space assets and advance space exploration.

Other top stories

B61-12 bomb reaches major milestone

A major milestone has been achieved with the recent delivery of the first production unit (FPU) of the B61-12, meaning the refurbished bomb is on track for full-scale production in May 2022. The bomb has been undergoing a life extension program for more than nine years.

Los Alamos and Sandia National Laboratories are the design agencies for the project, with Los Alamos also being responsible for producing detonators and other classified components.

Integrating diverse satellite images to sharpen our picture of activity on Earth

At Los Alamos National Laboratory, we've developed a flexible mathematical approach to identify changes in satellite image pairs collected from different satellite modalities, or sensor types that use different sensing technologies, allowing for faster, more complete analysis.

It's easy to assume that all satellite images are the same and, thus, comparing them is simple. But the reality is quite different. Hundreds of different imaging sensors are orbiting the Earth right now, and nearly all take pictures of the ground in a different way from the others. Watch this video to learn more.

Using supercomputers to reveal how X chromosomes fold, deactivate

Using supercomputer-driven dynamic modeling based on experimental data, researchers can now probe the process that turns off one X chromosome in female mammal embryos.

This new capability is helping biologists understand the role of RNA and the chromosome's structure in the X inactivation process, leading to a deeper understanding of gene expression and opening new pathways to drug treatments for gene-based disorders and diseases. Watch this video to learn more.

Newly identified tiny mineral named for Los Alamos and U. Wisconsin scientists

A vanishingly tiny mineral is being named for two scientists who have revolutionized the analysis of mineral samples. Xuite (pronounced "zoo-ite"), the newest member of the nano-mineral pantheon, is named in honor of Los Alamos National Laboratory mineralogist Hongwu Xu and the University of Wisconsin's Huifang Xu.

Optical biosensor device aids in biomarker identification

Work at Los Alamos National Laboratory, in conjunction with its research partners, provides valuable new insights into the diagnosis of tuberculosis (TB) using blood tests.

A paper in the journal "PLOS ONE" demonstrates the role that host-pathogen interactions play in detecting key biomarkers in blood, facilitating the diagnosis of disseminated or sub-clinical TB disease.

Discovery of new material could someday aid in nuclear nonproliferation

A newly discovered quasicrystal that was created by the first nuclear explosion at Trinity Site, N.M., on July 16, 1945, could someday help scientists better understand illicit nuclear explosions and curb nuclear proliferation. Watch this video to learn more.

Thin, stretchable biosensors could make surgery safer

A research team from Los Alamos National Laboratory and Purdue University have developed bio-inks for biosensors that could help localize critical regions in tissues and organs during surgical operations.

Stress in Earth's crust determined without earthquake data

Scientists at Los Alamos National Laboratory have developed a method to determine the orientation of mechanical stress in the Earth's crust without relying on data from earthquakes or drilling.

This method, which is less expensive than current approaches, could have broad applicability in geophysics and provide insight into continental regions lacking historical geologic information.

Bacteria, fungi interact far more often than previously thought

In a novel, broad assessment of bacterial-fungal interactions, researchers using unique bioinformatics found that fungi host a remarkable diversity of bacteria, making bacterial-fungal interactions far more common and diverse than previously known.

Lightning in the water: Ultrafast X-ray provides new look at plasma discharge breakdown in water

Lightning is fast, but how fast? A Laboratory collaboration recently turned to synchrotron X-rays for an answer. The story of the discovery of the connection between electricity and lightning is well known — in the 1700s, Benjamin Franklin, unaware of the danger of the electrical forces he was corralling, sent a key on a kite into the churn of a storm cloud. In the subsequent centuries, through experimentation and calculation, much has been learned about lightning, or plasma.

Guarding electrical power grids against hacker attacks

Physicist Ray Newell and his team were testing how to protect electrical networks long before the hacking of Colonial Pipeline's operating computers. Newell presented his research on fiber-optics encryption, which is in use at Los Alamos Laboratory during a free, Lab-sponsored Frontiers in Science virtual talk in May.

Potential melanoma-fighting agent discovered on sea floor near Antarctica

A Los Alamos scientist and his colleagues traced a naturally produced melanoma-fighting compound to a microbe that lives in an underwater species called an ascidian and known as a sea squirt. Scientist Patrick Chain noted the crucial detective work they performed to figure out which organisms and the underlying molecular machines produce the potential anti-melanoma properties.

Decades of research brings quantum dots to brink of widespread use

A new article in Science magazine gives an overview of almost three decades of research into colloidal quantum dots, assesses the technological progress for these nanometer-sized specs of semiconductor matter, and weighs the remaining challenges on the path to widespread commercialization for this promising technology with applications in everything from TVs to highly efficient sunlight collectors.

How microbiomes help secure the food chain

Scientist Sanna Sevanto, in the Laboratory's Earth System Observations group, and her team are researching how microbial adjustments in soil can alter a plant's physiology. Could a plant be made to require less water by adding microbes? That's the question Sevanto is trying to answer. The team is currently studying the efficacy of two different microbiomes: one from the Crops Research Laboratory in Fort Collins, Colo., and the second from Los Alamos. Watch this video to learn more.

Translation software enables efficient DNA data storage

In support of a major collaborative project to store massive amounts of data in DNA molecules, a Los Alamos National Laboratory–led team has developed a key enabling technology that translates digital binary files into the four-letter genetic alphabet needed for molecular storage.

Colloidal quantum dot lasers poised to come of age

A new paper by authors from Los Alamos and Argonne national laboratories sums up the recent progress in colloidal-quantum-dot research and highlights the remaining challenges and opportunities in the rapidly developing field, which is poised to enable a wide array of new laser-based and LED-based technology applications.

To read more:
https://discover.lanl.gov/news/stories/1222-top-science-stories

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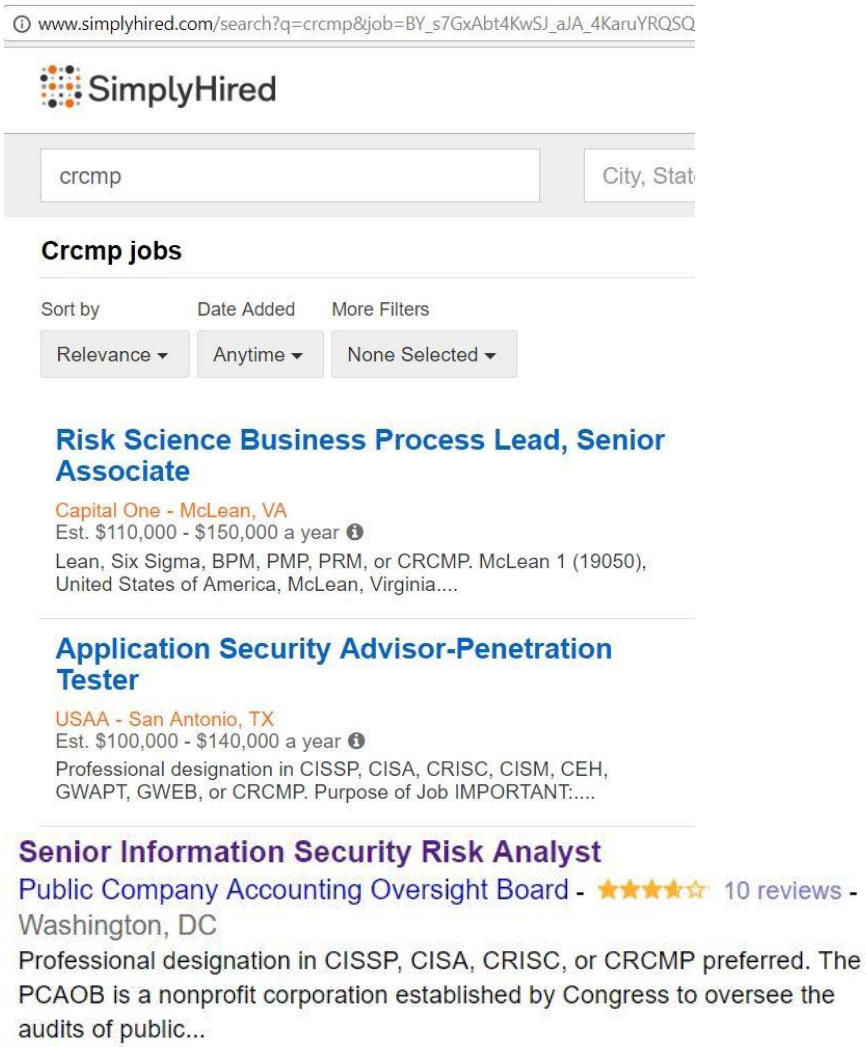

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