BREAKING NEWS

Save the date for EURAD third annual event !

13-16 March 2023

The event will provide an action-packed 3 days of sharing the latest progresses and challenges across all EURAD work packages. It will be in person and hostel in Cyprus.

Monday 13th: General Assembly n°8 (on invitation only)

Tuesday 14th to Thursday 16th: strategic plenary session, panel session, breakout sessions, student's event, EURAD WPS results presentations, lively debates

The exact location of the event will be communicated soon. Thank you to the University of Cyprus for offering to host this event.

University of Cyprus

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INTERVIEW WITH ALEXANDRE DAUZERES (MAGIC WP LEADER)

The mission of EURAD is to organize a step change in collaboration between various national programmes of different state of advancement and of different categories of actors. How does this objective impact your life as coordinator of the MAGIC Work Package (WP)?

Coordinating the interactions between partners from various fields, as well as promoting data exchange requires a great investment of time and effort for a WP Leader. The MAGIC WP was indeed designed and co-built with the philosophy of interacting and sharing instilled by EURAD. Past European projects have influenced the way it is coordinated. Learning from experience is proving to be wise. By combining very different technical specialties such as chemistry, mechanics and microbiology, around a single material, concrete, the MAGIC WP can be considered as a kind of prototype where the collaborative approach and the comparison of results are the necessary conditions for the project success. There is a strong interdependence between the tasks and even between many partners. This requires a lot of energy from the task leaders and the whole coordination team, including the WP Leader, to run, encourage and regularly support the exchanges. In order to ensure that these intentions of interaction do not remain just vain hopes, a tool was created under Sharepoint called the IDPC (Interactive Data Platform for Cement), in which MAGIC's participants can share, exchange with one another both in terms of the results and the experimental or numerical means used. Knowledge development, which is a result of the collaboration within the WP, is one of the main drivers for my participation in EURAD. Otherwise, due to the heterogeneity in the state of advancement and the various national programs, the choice was done in MAGIC to work on generic case as base case to avoid favoring a particular disposal concept.

The motivation for participation of individual partners is sometimes in balance between the technical mission and the finances. Can you mention how the organization/coordination of EURAD favours the technical missions compared to previous project?

Even if I was only an actor and not a task or a WP leader before EURAD started, I have witnessed how complicated it is to bring together all the research actors over a long period of time (several years). EURAD, already by its financing mode (about 50% of the total budget of the R&D projects), attracts partners ready to finance a significant part of the research around common objectives. This mode of operation naturally induces a strong motivation among the participants, for whom science comes first. However, one should not forget the possible other side of the coin: countries with smaller funds may be self-censoring in the contributions they can make due to lack of additional budget; whereas one of EURAD's missions is to improve the skills of organisations in less advanced Member States in developing their research on radioactive waste disposal.

Compared to previous EC projects, what has changed?

EURAD is above all the result of the reflections of three colleges (TSO, RE and WMO) whose

interests were taken into account in the design of the Strategic Research Agenda, the roadmap and the definition of the WPs in a transparent approach. As mentioned earlier, the degree of interactions, the level of collaboration is greater within the WPs. The EURAD programme also integrates a range of strategic studies, as well as knowledge management WPs (including the mobility of young researchers, such as post docs or doctoral students). This initiative of having integrated into the project these WPs, which work in coordination with the scientific WPs, is a significant demonstration of the research transparency carried out, from the permanent concern to share knowledge beyond the thematic perimeters to the integration of civil society representatives. These recent initiatives within the framework of European projects are regularly reviewed in an attempt to improve processes, particularly in the area of knowledge management, as the EURAD programme progresses. In the MAGIC WP, many actors have contributed to previous European projects such as CEBAMA. In my opinion, the EURAD added value is the interaction between the partners and between the WPs.

Your research program covers vast domains in science from rock mechanics to microbiology. What are your observations when trying to organize a real pluridisciplinary approach?

MAGIC is the result of a multidisciplinary intention. We wanted to bring together the field of cement chemistry, including reactive transport (a subject dealt with in particular in CEBAMA), with the field of concrete mechanics. The performances required from cementitious materials in disposal are ultimately mainly mechanical but also depend on their chemical evolution over time. I had seen during previous experiences how complicated it is to have a collaborative approach between these two very different fields in terms of scientific approaches and the definition of objectives. In addition, we wanted all the disturbances to be integrated (apart from the chemistry of the packages) that will be applied in disposal conditions. Therefore, microbial activity are included, which until then had almost never been taken into account. Three themes, three families of specialists with very few past collaborations were brought together. Serious discussions related to the aspects to whether or not include into the WP took place. By the time MAGIC's roadmap was established, a real organization was implemented: internal MAGIC partnerships were set up and were not a legacy of previous partnerships as had been the case in the past, and the co-construction between the 3 families of specialists of common experiences. In my opinion, the multi-scale approach proposed through the tasks structuring has partially solved the inherent obstacles of the multidisciplinary approach; it is a real satisfaction. Where I initially imagined that MAGIC would be able to have a multidisciplinary approach both in the experimental and modelling fields, our ambition had to be lowered because of time constraints. As an example, we came to realise that it would not be possible to address the field of microbial disturbances in our large-scale chemical-mechanical codes, but only to integrate the chemical consequences of this activity. However, we hope that MAGIC will initiate this work for future European projects. After a year of activity, one of the main objectives which was to see chemists, mechanics and microbiologists working together around common objectives has been achieved for me. And I hope this approach will be a first step for future crossed collaboration to improve the long term evolution of geological disposal facilities.

Did you know?

EUROHPC PETASCALE SUPERCOMPUTER DISCOVETER IN BULGARIA - SHORT DESCRIPTION AND APPLICATION OPPORTUNITIES FOR THE AIMS OF EURAD

(Announced during the DONUT virtual meeting, 2-3 February 2022 from the team of Technical University of Sofia (TUS)

Based of Council Regulation (EU) 2021/1173 of 13 July 2021 is established the European High Performance Computing Joint Undertaking. The EuroHPC JU is acquiring petascale supercomputers and one of them is located in Sofia Tech Park, Bulgaria. This "Discoverer PetaSC" is one highest-performance pre-exascale and petascale supercomputer which main CPU Partition has architecture BullSequana XH2000. There are available 10 million total core hours for Benchmark & FastTrack Calls and 154 million total core hours for Regular Calls. Only proposals with a civilian purpose and open information for public are eligible to participate in Discoverer PetaSC calls for proposals.

There are two options continuously open calls for applications and access to the "Discoverer PetaSC" for using of resources for benchmark calculation within of EURAD Project:

1. **Call for Proposals for Discoverer Fast Track & Benchmark Access Modes.** The allocations are granted for 4 months with an option for a continuation.

2. **Call for Proposals for Discoverer Regular Access Mode.** The next indicative cut-off dates for proposals are 15 July 2022 and 15 October 2022 – 24:00 AM EET. The allocations are granted for one year with the option for projects to apply for a continuation.

Short letter of interest for prior consideration in the process of application could be send to:

Prof. DSc. Ivan Dimov, *ivdimov@bas.bg*

Prof. Dr. Ivan Ivanov, *ivec@tu-sofia.bg*

Web-site: *https://sofiatech.bg/en/petascale-supercomputer/*

Mobility Programme – Status update

The EURAD Mobility Programme was launched in April 2020. Its aim is to facilitate the transfer of knowledge from experts in the field to students and early-stage researchers involved in EURAD. To this end, it financially supports students and early-stage researchers to perform internships and technical visits to partner institutes within EURAD. These activities should focus on the transfer of implicit and tacit knowledge, as these are more difficult to transfer via traditional classroom-based courses. Due to its unfortunate launch date, however, the Mobility Programme was not very successful during its first year. Only 6 applications were made in 2020 and 2021

Since then, a lot has changed. The COVID pandemic weakened, causing travel restrictions to disappear, and the Mobility Programme itself was extended! Since October 2021, it is also allowed to perform internships and technical visits to organizations outside of EURAD. But there is more! Since April 2022 the Mobility Programme also financially supports end-users to attend conferences and training courses, thus widening the initial scope of the Mobility Programme. In addition to widening the scope, the lump sums were also revised, resulting in higher sums for short stays, capped at a maximum of 3000 euro per stay. Because we are aware that this amount is potentially restrictive for longer mobility actions, exemptions can also be requested to the Bureau and PMO. Since these changes were implemented, 7 mobility applications were filed and all of them were approved by the reviewers! This means that in the first half of 2022 more applicants have applied than over the course of 2020 and 2021 combined.

We hope to continue this trend in the coming months. Starting with the upcoming application deadline on June 30th, 2022. For detailed information on the Mobility Programme click here. To apply directly, click here.

Facilitated mobilities for Ukrainian partners

Following the announcement of facilitated actions of mobility to support EURAD Ukrainian partners, 4 persons received financial support.

This measure remains open to all EURAD Ukrainian partners.

You can contact WP13 for more information: euradwp13@sckcen.be

STRATEGIC RESEARCH AGENDA UPDATE

In September 21 the Bureau presented to the General Assembly a process for the update of the EURAD Strategic Research and knowledge management Agenda (SRA).

This process (EURAD Deliverable 1.8), developed in consultation with the Colleges and PREDIS, was approved by the General Assembly and its implementation started in 22.
A first milestone was the development of a new classification scheme for the SRA topics. This new scheme will no more be based on a quantitative evaluation of the joint level of interest for SRA topics but on a qualitative assessment of the drivers motivating their consideration in the SRA. This first milestone was achieved in May 22 and the current version of the SRA is being revised to consider this new classification scheme.

In parallel each College (and PREDIS) started the identification of the updates of the SRA (in terms of topics to be added, withdrawn or modified) they would like to include in the revised SRA.
Each college (and PREDIS) is requested to document this exercise in a position paper by the 9th of September 22. Considering this input, the Bureau will draft a joint SRA update, in consultation with the Colleges and PREDIS.
The objective is to reach a joint and mature update of the SRA beginning of 23. This update will be an important input for the preparation of the EURAD2 proposal (identification of Work Packages etc.).

The Bureau thanks the Colleges and PREDIS for they active contribution to this update process, strategic and important for the future of EURAD.

Focus – MAGIC WP

PROMISING ADVANCES IN THE FIELD OF HYDRO-CHEMO-MECHANICAL MODELLING OF CONCRETE AGEING

In the framework of task 4 of the MAGIC Work package, teams from Mines ParisTech (Nicolas Seigneur) and CEA (Benoit Bary, Stéphane Poyet and Gaëtan Touzé) are working together to achieve a coupled description of chemical, hydric and mechanical effects during the atmospheric carbonation of cementitious materials. To this end, Dr. Adrien Socié was hired as a postdoc to couple Hytec, a reactive transport code developed at Geosciences, center of MINES Paris and Cast3m, a finite-element mechanical software developed at CEA. This coupling is based on finding the appropriate microstructural and mineralogical information provided by Hytec to calculate the mechanical response of the material. Cast3m thus predicts the appearance of cracks which are incorporated within Hytec and modifies the subsequent reactive transport processes. So far, the developed crack network is similar to the one obtained from microtomographic images (see Figure below), but future work will allow a better comparison and prediction of degradation depths.

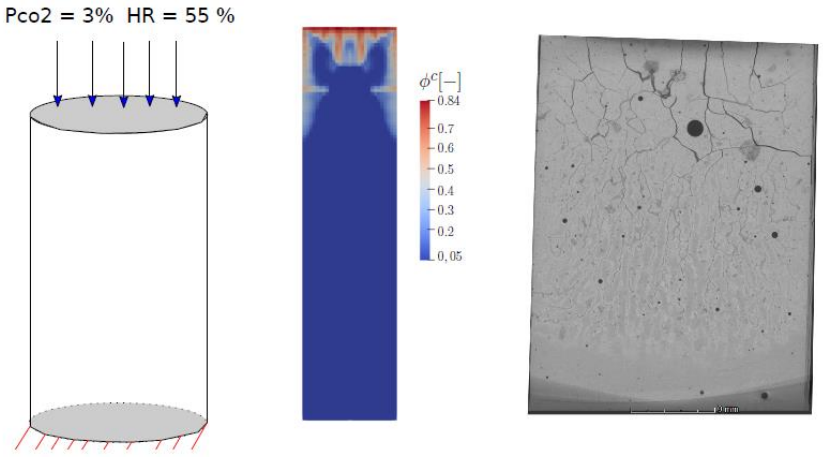


Illustration 1: Coupled chemo-hydro-mechanical simulation of the atmospheric carbonation of a C-S-H paste. Left: conceptual model. Middle: modelled crack appearance. Right: microtomographic image of the carbonated sample

Focus – ROUTES WP

LATEST DEVELOPMENTS OF ROUTES TASK 3 "DESCRIPTION AND COMPARISON OF RADIOACTIVE WASTE CHARACTERIZATION APPROACHES"

The ROUTES ("Waste management routes in Europe from cradle to grave") work package aims, among other objectives, to provide a platform for sharing knowledge and experience, but also to identify safety-relevant issues as well as their R&D needs. Within ROUTES, Task 3 deals with the radioanalytical characterisation of wastes with complex or toxic properties, as well as legacy wastes. The latest workshop organised by Task 3 from 2nd to 4th of May 2022 provided an opportunity for participants to share and discuss general waste characterisation strategies of their countries, and to analyse and discuss approaches and experiences in the radioanalytical characterisation of specific waste types. Current radioanalytical characterisation methods for selected waste types were analysed in-depth, in order to identify issues and knowledge gaps. Particularly, the needs of member states with low inventories (SIMS) were discussed, as they face specific challenges due to limited human and financial resources. All results of the workshop will be included in the deliverable 9.7 "Review of radioanalytical characterisation of selected radioactive wastes and wastes with complex chemical and toxic properties" of Task 3. The workshop was concluded with an outlook on future work, specifically characterisation and segregation of legacy waste, which will be addressed in the deliverable 9.8 "Review of characterization of legacy and historical wastes" of Task 3.

A look back – EURAD second annual event

All recordings from the annual event and short resume are now available on the EURAD website. You can also find there the recording of the follow-up event on "Evaluating the impacts of the WPs" that took place early June.

A look back – EURADWASTE'22

EURADWASTE'22/FISA 2022 took place from May 30 to June 3rd. On the first day, part of EURAD participants attended an important workshop on the mid-term evaluation of EURAD and steps towards a EURAD-2. (see picture 2). The results of this workshop have been shared with the Consortium through a joint paper with PREDIS (link on PP). During the rest of the week, we have been able to hear about progresses in each WP, not only during the invited talks but also informal conversation and posters session.

It felt quite nice to be able to see the EURAD community (Picture 1) as well as trying to gather WP leaders (Picture 3) and Bureau members (Picture 4) for an official picture!

Finally we are glad to share that EURAD students have been rewarded, here illustrated with pictures of Laura Gonzalez Blanco (Picture 5) and Yanting Qian (Picture 6).

A look back – 8th Clay Conference

With no less than 50 posters (!) and a large number of talks, EURAD was well represented during the 8th Clay Conference which took place in Nancy from 13th to 16th June.

Top: Audience during the Clay Conference

Middle: Séverine Levasseur, GAS co-WP leader presenting a keynote on GAS.

Bottom: gala dinner Abbayes des Prémontrés

Now published

ROUTES - Implementation of the ROUTES ICS action plan first phase - CS discussion and input focused on the first topic identified in the ICS action plan (D9.16) - Link

The work of ROUTES Task 7, related to the interactions with civil society (ICS), has mainly focused on the investigations in relation to the ROUTES Task 6 on "Shared solutions for European countries" to produce D9.16. The positions of ROUTES' participants and the CS larger group on shared solutions/facilities for radioactive waste management were gathered through a questionnaire and analyzed on the deliverable (challenges, added-value, further steps, governance of shared solutions among others).

ROUTES - A review of past and present studies and plans for developing shared solutions for radioactive waste management in Europe (D9.12) – Link

The objective of this report, performed by COVRA as part of ROUTES Task 6, is to summarise studies and plans for developing shared solutions and technologies for radioactive waste management in Europe. This deliverable summarises the knowledge and approaches regarding the sharing of technology and facilities between countries in different steps of the waste lifecycle.

EURAD Knowledge Management and Networking Programme - Link

This strategy document, entitled 'Knowledge Management and Networking Programme' communicates the overarching vision for how the four KM WPs above work together to deliver value for the organisations participating in EURAD and for other organisations worldwide. It describes the link between the EURAD Roadmap and the EURAD knowledge management, the mechanisms for how various types of end-users can interact with the KM WPs and the long-term vision for KM in radioactive waste management in the European Union.

Upcoming events

JULY

04-06: DAEF 2022

20-22: NEA RWMC workshop on developing safety cases for various

SEPTEMBER

12-13: CEE NIC 2022

13-15: 14th International Symposium on Nuclear and Environmental Radiochemical Analysis

20-22: IGD-TP Symposium

21-23: Decay Days 2022

28: EURAD L&L on "A pluralistic tool of dialogue on RWM – the Pathway Evaluation Process (PEP)

Students Corner

Aadithya Gowrishankan – SCK-CEN

Can you explain the scope of your thesis and the link with the workpackage you are involved in?
The scope of my PhD project is in characterising gas transport behaviour in partially saturated clay based materials in the context of nuclear waste disposal. In brief, I will be experimentally determining the diffusion coefficients of different gases in varying degrees of saturation, in both Boom Clay (potential Belgian host rock) and synthetic clay mixtures.

What do you wish other people knew about your thesis scope?
I wish, through my work, to be able to contribute to the understanding behind the different safety cases in the context of deep geological disposal of high level radioactive wastes. During certain stages in a nuclear waste repository, unsaturated conditions could exist. Desaturation, simply put, means that that the given porous material has lost some of its total water content repository. However, there do exist some minor knowledge gaps. For instance, gas diffusion coefficients in partially saturated conditions are not known and the extent of the effect of desaturation on gas transport has not yet been observed.

Therefore, my study, complemented by various others within the same framework of WP GAS, could help bridge the knowledge gaps mentioned above.

According to you, what will be the impact of your thesis in your field of research?
Deep geological disposal is a concept that has been researched for many years now. We already have significant knowledge behind the various technical concerns that could arise within a nuclear repository. However, there do exist some minor knowledge gaps. For instance, gas diffusion coefficients in partially saturated conditions are not known and the extent of the effect of desaturation on gas transport has not yet been observed. Therefore, my study, complemented by various others within the same framework of WP GAS, could help bridge the knowledge gaps mentioned above.

What was your first impression of EURAD?
My first impression of EURAD was actually formed about two months into my PhD project. Initially, I was only aware that my project was a part of a large European collaboration but I only found out the true extent of the vast research topics during the EURAD annual event in 2021, which, even though was online, left me quite amazed and thankful to be a part of this sort of a collaboration.

How is EURAD an opportunity for you?
EURAD is perhaps the largest and most fruitful collaborative effort in terms of radioactive waste management (RWM). It brings together knowledge and concepts from many different European countries and provides grounds for active knowledge transfer among the different participating institutions. For a young researcher, this is perhaps the most helpful learning platform that they could have asked for.

What do you find most challenging about your PhD/post-doc/master? And how did you overcome these challenges (if relevant)?
Like almost all other experimental research, the very cliché but still very significant challenge lies in developing and optimising a method to tackle a novel problem. In my specific case, it is about assembling and optimising a physical setup that is capable of performing pure gas phase experiments in partially saturated conditions within the time frame of EURAD GAS.

What future career are you thinking about? If relevant, how was this choice influenced by your work in EURAD?
While it is still a bit too early in my PhD to say with certainty, I am strongly inclined to continue working in fluid transport related research in the context of nuclear waste disposal. SCK CEN, the EURAD partner institution where I work, has afforded me the relevant training and exposure to be able to understand and carry out experimental research in this domain.

What do you hope to achieve in your future career?
Among the few tiny ambitions that I have so far, the most significant one would be to contribute to my part in helping with RWM, especially disposal. Whether it is by communication or scientific research, will become more evident to me with the progression of my PhD research.

Students Corner

Joost Zoutendijk – TU Delft

Can you explain the scope of your thesis and the link with the workpackage you are involved in?
I am a MSc student Geo-Engineering at TU Delft working on numerical modelling using the Finite Element Method. For my thesis I am developing a new mechanical constitutive law for zero-thickness interface elements that includes both cohesion and friction. Interface elements can be used to model discontinuities that can function as preferential pathways for gas migration in clay. This constitutive law is developed to model opening and closing of discontinuities due to water and gas pressures. My work is used to get a better approximation of the mechanical behaviour of discontinuities. The constitutive law is implemented in FEM software LAGAMINE. Currently I am working on validation of the constitutive law for clay using shear box data.

What do you wish other people knew about your thesis scope?
The complexity of the problem of underground long term radioactive waste management, and how useful numerical modelling can be to gain insight in the validity and risks associated of solutions to the waste management problem

According to you, what will be the impact of your thesis in your field of research?
The work of my thesis will allow other researchers working with purely cohesive constitutive laws to use a constitutive law that more closely resembles the observed mechanical behaviour of discontinuities. The constitutive law is developed with the goals of having understandable and measurable input parameters and to not be more computationally expensive than a cohesive law. Therefore, the constitutive law I developed can easily replace purely cohesive laws and find widespread use.

What was your first impression of EURAD?
I am impressed with the large number of smart and motivated people who come together to work on the problem of radioactive waste management in the specialized work packages. This motivates me to add to the body of knowledge surrounding gas transport behaviour and the mechanical response of clay to gas migration.

How is EURAD an opportunity for you?
The concentrated knowledge about gas migration in clay in the EURAD programme work package Gas allowed me to quickly understand the topic of my thesis and define the scope.

What do you find most challenging about your PhD/post-doc/master? And how did you overcome these challenges (if relevant)?
Keeping focus and motivation when working alone for an extended period during my thesis was not always easy. I found it helpful to ask my supervisor for regular help to keep my research pointed in the right direction.

What future career are you thinking about? If relevant, how was this choice influenced by your work in EURAD?
I would like to get experience as a geotechnical engineer working in implementing the solutions to geotechnical problems I have encountered during my educational career. I hope to return to research at a later time since I have been enjoying working on my thesis a lot, but I think having experience in the field will help improve my understanding of realistic solutions to geotechnical problems.

What do you hope to achieve in your future career?
I hope to find meaningful solutions to complex problems that present itself in our interaction with the earth and to share knowledge about these problems and solutions with other professionals and the wider public.

We are out there

Jerry Peprah Owusu • 2e
Doctoral Researcher and Ph.D. Candidate at University of Bern and P...
2 j • Modifié •
+ Suivre

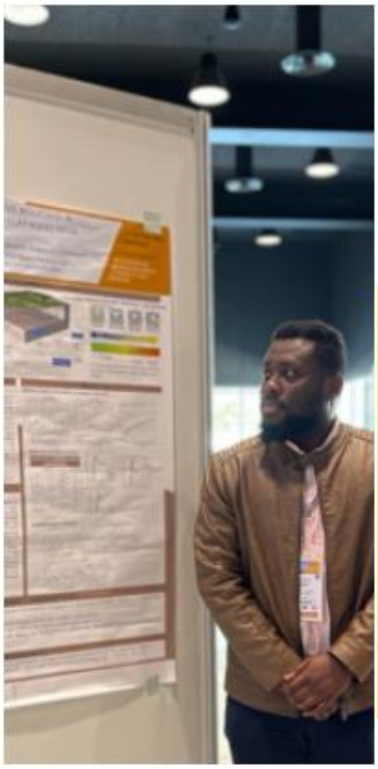
I had an amazing experience at the Clay Conference 2022, held in Nancy France. I want to thank Eurad, Paul Scherrer Institut and the University of Bern, for giving us, young scientists and engineers, the opportunity to represent and show our work.

I am enthused at the synergies built between all the nuclear waste management organisations, and all the partner universities and institutions. It is an amazing work that is being done to design a safe geological disposal for nuclear waste for the world.

I presented a poster on modelling diffusion of gases in clay rocks by molecular dynamics simulations and pore scale lattice boltzmann modelling. I look forward to the next Clay Conference in 2024 in Hannover- Germany.

#work #france #clayconference #moleculardynamics #latticeboltzmann

Voir la traduction



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@FFision host this week 3 scientists from the "Universidad de Granada" to prepare the samples for irradiation and microbiological experiments. #Science for #Nuclear Safety. Fruitful colaboration within ConCorD EC project @EJP_EURAD ! @CIEMAT_OPI

ESI Group
@ESIgroup

During the annual MODATS meeting @EJP_EURAD that took place in Paris on June 9, ESI and @AMVALOR_ have been invited by @Andra_France to present their contribution to the development of a #Hybridtwin for storage facilities. We thank all the contributors!

#SYSTUS #nuclear #energy

Traduire le Tweet