FICHE A COMPLETER POUR PUBLICATION D'EMPLOIS SCIENTIFIQUES (hors BIATSS) DANS LE PORTAIL « EURAXESS JOBS »

A COMPLTER EN ANGLAIS ET A RENVOYER à : drv-euraxess@univ-amu.fr en FORMAT WORD

❑ Cochez la case si vous souhaitez **aussi** publier dans **Academic Positions,** plateforme internationale d'emploi scientifique (si visibilité internationale requise par le poste) : dans ce cas **la durée de publication** – durée entre la date de publication et la date limite de candidature - **DOIT IMPERATIVEMENT être supérieure à 3 (TROIS) MOIS**.

Autres sites ou plateformes d'emplois où votre offre a été publiée
1. **2.** **3.**

JOB TITLE: 18-month Postdoctoral Position in Advanced Battery Management Systems and Energy Storage Integration for Hybrid Renewable Energy Systems

RESEARCHER PROFILE
❑ PhD / R1: First stage Researcher
☒ Postdoc / R2: PhD holders
❑ Researcher, Assistant Professor/ Senior Lecturer / R3: Established Researcher
❑ Professor, Tenure track / R4: Leading Researcher

RESEARCH FIELD(S)[1]: Engineering, Computer Science, Energy
MAIN SUB RESEARCH FIELD OR DISCIPLINES[1]**:** Battery Management Systems, Energy Storage, Power Electronics, Control Systems, State Estimation

JOB /OFFER DESCRIPTION :
The Laboratoire d'Informatique et des Systèmes (LIS - UMR 7020 CNRS/AMU) invites applications for an 18-month postdoctoral position in advanced battery management systems and storage integration. The position is funded by the CETPartnership/ANR through the OMRES project (Operation, Maintenance and digital twin solutions for hybrid Renewable Energy Sources).

RESEARCH TEAM:

The successful candidate will join the COSÉ team (Contrôle et Optimisation des Systèmes et Énergie), specializing in energy storage systems, power electronics, and optimization for renewable energy integration. The position offers unique opportunities to work on cutting-edge BMS technologies within the context of hybrid renewable energy systems.

RESEARCH OBJECTIVES:

The postdoc will focus on developing innovative solutions for energy storage systems with four main research axes:

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1. ADVANCED SOC/SOH ESTIMATION
   - Online Electrochemical Impedance Spectroscopy (EIS) implementation
   - Machine learning-based diagnostic from impedance spectra
   - Remaining Useful Life (RUL) prediction with uncertainty quantification
   - Transfer learning between different battery chemistries

2. ADAPTIVE BMS FOR HETEROGENEOUS STORAGE
   - Manage hybrid storage systems (Li-ion + emerging technologies)
   - Develop active balancing strategies for mixed technologies

3. DIGITAL TWIN FOR BATTERY SYSTEMS
   - Develop real-time digital twin incorporating electrochemical, thermal, and aging models
   - Implement Physics-Informed Neural Networks (PINN) for accurate state prediction

4. STORAGE INTEGRATION FOR HYBRID RES
   - Optimal sizing and operation of BESS in wind-PV hybrid systems
   - Develop degradation-aware control strategies for market participation
   - Implement Model Predictive Control for real-time energy management
   - Create flexibility services for grid support (frequency regulation, voltage control)
   - Integration with OMRES digital twin platform for system-level optimization

KEY RESPONSIBILITIES:
- Design and implement advanced BMS algorithms for SOC/SOH estimation
- Develop battery digital twin models with real-time capabilities
- Integrate storage solutions with renewable energy forecasting tools
- Perform Hardware-in-the-Loop (HIL) testing using Opal-RT/Typhoon platforms
- Collaborate with OMRES partners on storage-RES integration strategies
- Publish in high-impact journals (IEEE Trans. Power Electronics, Applied Energy)
- Contribute to OMRES deliverables on storage optimization and control

REQUIRED EXPERTISE:
- Strong background in battery modeling (ECM, electrochemical models)
- Experience with state estimation techniques (Kalman filters, observers)
- MATLAB/Simulink for system modeling
- HIL testing experience (Opal-RT/Typhoon preferred but not mandatory)

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RESOURCES & ENVIRONMENT:

- Access to battery testing facilities and HIL platforms
- Collaboration with OMRES consortium (Cyprus, Denmark, France)
- High-performance computing for digital twin development
- Budget for conferences and equipment

This position bridges advanced BMS research with practical renewable energy integration, contributing to the OMRES vision of optimized hybrid energy systems while advancing the state-of-the-art in battery management technologies.

TYPE OF CONTRACT: ❑ PERMANENT ☒ TEMPORARY ❑ TO BE DEFINED
JOB STATUS: ❑ FULL TIME ❑ PART TIME ❑ NEGOTIABLE
HOURS PER WEEK _____
APPLICATION DEADLINE (If not applicable, report the envisaged staring date): (Day/Month/YYYY) **& TIME** (00:00)
ENVISAGED STARTING DATE: (01/01/2026)
ENVISAGED DURATION: 18 months
IS THE JOB FUNDED THROUGH AN EU RESEARCH FRAMEWORK PROGRAMME? ☒ YES ❑ NO
If yes, please specify: Clean Energy Transition Partnership

HOW TO APPLY:
Send application to: seifeddine.ben-elghali@lis-lab.fr

- Subject line: **"PostDoc-BMS-Storage-[YourName]"**
- Single PDF attachment
- Confirmation email within 48h

WORK LOCATION(S):
LIS UMR 7020 CNRS / AMU / UTLN
Aix Marseille Université – Campus de Saint Jérôme – Bat. Polytech
52 Av. Escadrille Normandie Niemen
13397 Marseille Cedex 20
Tel : +33 (0)4 12 23 12 52 / 51
secretariat@lis-lab.fr

WHAT WE OFFER: (Benefits, salary, professional opportunities, etc.)

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Additional information: The Euraxess Center of Aix-Marseille Université informs foreign visiting professors, researchers, postdoc and PhD candidates about the administrative steps to be undertaken prior to arrival at AMU and the various practical formalities to be completed once in France: visas and entry requirements, insurance, help finding accommodation, support in opening a bank account, etc. More information on AMU EURAXESS Portal

QUALIFICATIONS, REQUIRED RESEARCH FIELDS, REQUIRED EDUCATION LEVEL, PROFESSIONAL SKILLS, OTHER RESEARCH REQUIREMENTS

Education & Experience

- **PhD in** Electrical Engineering, Energy Systems, or related field - Specialization in batteries, energy storage, or power electronics
- **Experience**: 0-3 years post-PhD (fresh graduates welcome)
- **Publication record**: Minimum 2 papers in recognized venues (IEEE, Elsevier, Springer)

Core Technical Skills - MANDATORY

- Battery modeling (equivalent circuits, electrochemical models)
- State estimation algorithms (EKF, UKF, particle filters) - Power electronics and digital control
- BMS development experience (automotive or stationary)
- Programming: MATLAB/Simulink, Python, C/C++

PREFERRED QUALIFICATIONS:

- Hardware-in-the-Loop testing (Opal-RT, Typhoon, dSPACE)
- Embedded systems and real-time implementation
- Machine learning for diagnostics
- Standards knowledge (ISO 26262, IEC 62619)

Soft skills:

- **Autonomy**: Ability to manage research project independently
- **Teamwork**: Collaborate with research team
- **Communication**: Present complex ideas simply to diverse audiences
- **Analytical thinking**: Problem decomposition and solution design
- **Adaptability**: Switch between theoretical and applied work

REQUESTED DOCUMENTS OF APPLICATION

Application Documents (Single PDF, max 10MB)

- CV (2 pages max) including:
  List of publications with impact factors

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Google Scholar/ORCID
List of relevant projects

- Cover Letter (1 page)
- Research Portfolio:
  - One demonstration of BMS algorithm implementation
  - Battery model validation results
  - Code sample (Python/MATLAB/C)

- Scientific Production:
  - 2 best publications related to batteries/BMS
  - PhD thesis abstract (1 page)

- References:
  - 2 academic references with contact information

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