



Stellenbosch
UNIVERSITY
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STERG

Solar Thermal
Energy Research
Group

Guidelines for STERG Members in 2024

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Contents

1 Digital Infrastructure at STERG	4
1.1 Software Ownership and Skills	4
1.2 Departmental & STERG Simulation computers	5
1.3 STERG SharePoint	5
1.4 STERG Website	5
1.5 Corporate Identity	5
1.5.1. Fonts	6
1.6 STERG Templates	6
1.6.1 PowerPoint	6
1.6.2. Poster	7
1.6.3. E-mail Signature	7
1.7 Internet and ADSL	8
1.8 Other IT related matters	8
2 Compilation of Theses and Scientific Documents	9
2.1 Mathematical Typesetting	9
2.2 Data Visualisation	10
2.3 SU Documents for Theses	10
2.4 Language Selection	10
2.5 Name(s) of our University	10
3 Publications and Conferences	11
3.1 Keeping track	11
3.2 List of Accredited Journals	11
3.3 Important Conferences	11
3.3.1 SolarPACES	11
3.3.2 SASEC	11
3.3.3 Annual STERG Symposium	12
3.4 Previous Proceedings	12
4 Previous STERG Research	12
5 Physical Infrastructure at STERG	13
5.1 The STERG Roof Laboratory	13
5.2 SUNREC	13
5.3 STERG mini-library	13
5.3.1 Procedure for checking out books:	13
5.4 M4007 Open Plan Office Area Rules	14
5.4.1 Individual's responsibilities:	14
5.4.2 Servest cleaner's responsibilities:	15

Info

To keep this document up to date, please report any errors such as broken hyperlinks or outdated information to [Leigh van der Merwe](#).

With any questions with regards to marketing material /corporate identity please contact [Leigh](#) or [Ben](#).

1 Digital Infrastructure at STERG

1.1 Software Ownership and Skills

The following software is readily available:

- Numerical computation: MATLAB, Engineering Equation Solver (EES), SciLab
- Solar modeling: SAM, Greenius, PolySun, TSol, RetScreen
- Raytracing: SolTrace, Tonatiuh
- CFD and thermal modeling: ANSYS FLUENT, FLOWNEX, Epsilon Professional (STERG has licences for ANSYS FLUENT and Flownex)
- CAD: Inventor, Catia, Solid Works, AutoCAD
- FEM: Patran
- Programming: FORTRAN, C, Visual Basic, Python, Delphi, C#, Code-
vision AVR
- Miscellaneous: LabView, Diptrace, LaTeX, Mendeley, Inkscape, Sketchup

For installation of the most important software packages click on the link or contact the software 'owners':

- [MATLAB](#)
- ANSYS FLUENT: [Prof. Jaap Hoffmann](#)
- FLOWNEX: [Coenraad](#)
- [Epsilon Professional](#)
- [LaTeX](#)
- [Greenius](#)
- [SAM](#)
- [Star-CCM+](#)

Every year STERG organises an online **Flownex training event** as STERG funds the annual licence renewal for departmental use. The event is hosted online during the first recess period. An email will be sent close to the time.

Flownex is an excellent simulation tool to model real-world flow and heat transfer systems. It allows for fast, reliable, and accurate system and sub-system level simulation and optimisation. For more information, please see these links: <https://www.flownex.com/industry-application> <https://www.flownex.com/industry-application/academic>. To **install Flownex** go the Software Library in the [STERG SharePoint](#).

¹The university has acquired a campus wide Matlab license, activation key 13452-56192- 52887-66175-96715, TAH license 40558920

1.2 Departmental & STERG Simulation computers

The department provides (subject to availability) a high performance computer. The machine is equipped with 16 E5-2643, 3.3 GHz processors, 256 GB RAM and 1.0 TB HDD. It is operated by a Scientific Linux OS. The computer is under responsibility of Prof. Hoffmann, for further questions feel free to contact [Prof. Hoffmann](#) directly. The computer is open to all to log in at desk 22 in M4007.

STERG also provides a CFD capable machine open to STERG and Thermofluids students. It is located at desk 20 in M4007. For further questions feel free to contact [Leigh](#) directly.

1.3 STERG SharePoint

The [SharePoint](#) is a web-based platform to store information and share data. You should have permission to SharePoint, if not contact owner [Leigh](#). Note that the SharePoint might only work from within the SU network. You log in using your SUN username and password.

In the STERG Research library is a folder: STERG student research data repository within which you can create your own folder and upload your STERG research data and files. Use your Surname_Initial_student no as a name for your folder.

1.4 STERG Website

Stay up to date with STERG news posts and subscribe with your private email address at <https://sterg.sun.ac.za/news/> (subscribe at bottom of page). The SUN email addresses of all the new STERG students have been added to the STERG News Posts mailing list. If you know longer would like to receive the emails, contact [Leigh](#).

STERG publications are available at <https://sterg.sun.ac.za/publications/>. The direct link to our research group's web presence is sterg.sun.ac.za.

1.5 Corporate Identity

STERG has a corporate identity that consists of a font and a set of colours.

1.5.1. Fonts

In case you want to layout a document using the STERG font, use Trebuchet MS and Calibri Light which are the University's official fonts.

FONT SPECIFICATIONS

Stellenbosch UNIVERSITY UNIVERSITAT STELLENBOSCH | Solar Thermal Energy Research Group

Text Style	Specifications
HEADINGS	Should appear in UPPERCASE Left aligned Font: Trebuchet MS Bold 32-point Colour: Maroon RGB: R = 97, G = 34, B = 59 HEX: 61223b
Sub-headings	Should appear in sentence case Left aligned Font: Trebuchet MS Regular 28-point Colour: Gold RGB: R = 183, G = 153, B = 97 HEX: b79962
Body text	Should appear in sentence case Left aligned Font: Calibri Light 24-point (or smaller) Colour: Steel Grey RGB: R = 77, G = 83, B = 86 HEX: 4d534d
Emphasis	Should appear in sentence case Font: Calibri Bold (may be bigger than the rest of the body text) Choose an emphasis colour from the pre-populated Theme Colours

Figure 1: Font specifications which can be found in the STERG PowerPoint template

Important note: Fonts are mean!

If you type a text on your computer on a non-standard font (such as Railway), the text will appear in a different standard font on another machine that does not have the additional font installed. Possible solutions are creating a pdf or embedding the font in the particular file. **We recommend sticking to standard fonts** unless you intend to be fancy for marketing material or perhaps a poster (= stuff that is circulated in print form). The Trubuchet MS and Calibri Light are safe to use for digital or print.

1.6 STERG Templates

The following templates are provided by STERG.

1.6.1 PowerPoint

The generic STERG PowerPoint template(s): [SharePoint](#).

Warning: The presentation is in a 16:9 format. This corresponds to standard screens. Projectors are typically 4:3 format. Make sure to test run your presentation prior to an important event!

Be aware that specific templates are usually provided by STERG for major events, e.g. SASEC, STERG Symposium and SolarPACES. These will be circulated via email.

1.6.2. Poster

Scientific conferences typically require posters in the A0-format. STERG is in the process of developing a poster template and will be circulated when ready.

Please act with care when amending the poster to suit your purposes. Freedom is provided intentionally to edit the poster but please attempt to not disturb the corporate identity, such as color selections, background, etc.

1.6.3. E-mail Signature

STERG has its own e-mail signature adapted from the new SU email signature which members may use if they wish to represent STERG.

A standardised STERG-version of the new SU email signature has been created and you are welcome to make use of the email signature template on the [SharePoint](#).

Please read and follow the instructions for installation also on the [SharePoint](#).

Please adapt the email signature template with your details but do not alter the appearance as it is aligned with the university's corporate identity.

A default signature is shown in Figure 2.

James Smith BEng

MEng Candidate: Solar Thermal Energy Research Group
Mechanical and Mechatronic Engineering
Office number +27 21 xxx xxxx | Cellphone number +27 xx xxx xxxx
M4007, M&M Engineering Building, Joubert Street
Stellenbosch Campus | South Africa | Suid-Afrika
sterg.sun.ac.za | www.sun.ac.za | [Find us on social media](#)



Figure 2: The standardised STERG-version of the new SU email signature

Please note that the body copy font in mails must be the default Outlook Calibri, Regular, 11pt.

1.7 Internet and ADSL

The Wi-Fi at the Stellenbosch University is called **eduroam**. The University in 2024 charges a cost of R513 on your student account to be able to use eduroam. Connect with your private device or STERG provided laptop to the **RegisterMe! Wi-Fi** which should afterwards bring up a browser where you can login with your University credentials to accept the cost on your student account. If the browser does not open by itself, navigate to <https://registerme.sun.ac.za> You only have to do RegisterMe! on one device to enable your username to use eduroam. When registered, Forget the **Registerme!** Wi-Fi. Afterwards you click on eduroam Wi-Fi and type your US email address and password and click connect, then you accept the certificate. You can also use eduroam on your tablet or mobile phone. On Android phones you need to select **Don't validate** on the **CA certificate**. Your credentials can be used on up to 5 devices concurrently. For more instructions see www.sun.ac.za/wifi.

Important to remember, that if you change your network password, which needs to be done every 90 days, you need to **forget the eduroam setup** on all your devices and do the setup again.

Remember to use your full email address for your username.

The Department of Mechanical and Mechatronic Engineering has gigabit LAN access in the refurbished main building, and 100Mbit in the older labs that all assets are registered for.

It is possible to register your private laptop for the LAN at the Department, if it has a LAN adapter, or you can purchase a USB LAN adapter otherwise. The LAN has a much faster speed than Wi-Fi and should be more stable. You need to determine the LAN Mac address (Physical address) needed for registration. In Windows at a Command Prompt (cmd) run **getmac /v** -the built-in LAN will be called ethernet and a USB one typically Realtek or something with USB in the name. An USB LAN adapter needs to be plugged into the laptop when running getmac /v.

Mr Whitehead will only register your private device for the LAN, if you have **1st registered for Eduroam** and are having connection issues with the Eduroam.

He also needs the version of your Windows 10/11 as listed at the top when you run Command Prompt (cmd) for example Microsoft Windows [Version 10.0.19045.4046]

When you have the LAN Mac address, you can email [George Whitehead](mailto:George.Whitehead@sun.ac.za) with your Mac address & room number where you sit, either M4007 or M4023 to register your LAN for you, as well as the version of your Windows from the line above.

1.8 Other IT related matters

For any IT/technological related issues log a call on the ICT Partner Portal: servicedesk.sun.ac.za

2 Compilation of Theses and Scientific Documents

2.1 Mathematical Typesetting

This is a summary of some basic rules of typesetting. More details about most topics can be found in a document by Dr. Els².

Spaces

- Between a value of a quantity and its unit is a non-breaking (small) **space** [*Ctrl+Shift+Space* in Word, *Alt+0160* in PowerPoint]. This space has always the same width and doesn't break over lines. A space is also to be set before the percentage sign (3 %) and before degrees Celsius (3 °C) but not before the angular degree sign (3°).
- The SI-conform separator for numbers with more than 4 digits is also a non-breaking space. Commas or points are ambiguous.
- The used **decimal indicator** in American and British English is the full stop/period³. An accordingly typed quantity is: 123 456.78 kW.

Roman/Italic

- Variables in mathematical equations **and** in the text should be written in *italic* letters.
- Units and functions should be written in roman letters (upright like this text).
- Universal constants and **descriptive** subscripts should be written upright, **variables** in subscripts in italics.

$$E = m c^2$$
$$F = \sum_{i,j}^n (T_{\text{amb},i} \xi_j) \text{ kJ/K}$$
$$\frac{du}{dt} = \sin 5x$$

'*E*' and '*m*' are variables.

'*c*' is the universal speed of light.

'*F*', '*T*', '*i*' and '*j*' are variables.

The subscript '*amb*' is descriptive.

'kJ/K' is a unit.

'*d*' and '*sin*' are functions.

'*u*', '*t*' and '*x*' are variables.

²Guide for the Use of the International System of Units (SI)

³Although the comma is used in South African English, the period is recommended and commonly used in academia since we are working in international research.

General Rules Equations have to solve for units.

One correct way:

$$\dot{Q}_{\text{loss}} = \left[0.141 (t/^{\circ}\text{C}) + 6.48 \times 10^{-9} (t/^{\circ}\text{C})^4 \right] \text{W/m}$$

Incorrect: $\dot{Q}_{\text{loss}} = [0.141 t + 6.48 \times 10^{-9} t^4] \text{W/m}$

Try to be consistent with the variables. For example, don't use Q for heat and heat *rate*. It is good practice to use \dot{Q} for the latter.

2.2 Data Visualisation

A guide to making visualisations that accurately reflect the data and look professional can be found on the website for the book "[Fundamentals of Data Visualization](#)," published by O'Reilly Media, Inc.

2.3 SU Documents for Theses

Current SU Mechanical Engineering templates and guidelines can be found on SUNLearn.

2.4 Language Selection

Each researcher has the freedom to decide on his choice of language in writing a thesis. You should be careful to stick to one selected language throughout your work. The selection of AE vs. BE should be carefully considered and discussed with the study leader/supervisor.

At this point, be advised that the default language at STERG is British English. It is each individual's freedom to write a thesis in BE or AE and consistency is the golden rule. It has to be stressed that care has to be taken with regards to names of technologies that might have been created with in a specific language (especially spelling of pressurized vs pressurised). It is case dependent how to handle such situation, but generally good practice to write such technologies in your language choice with a footnote elaborating on the original name and done changes.

2.5 Name(s) of our University

University corporate identity guidelines encourage the use of 'Stellenbosch University' when referring to this university.

3 Publications and Conferences

3.1 Keeping track

Please kindly notify [Leigh](#) once you have an accepted publication. It is important for us to keep track as it is a performance metric of the research group towards our funders as well as our effort to keep our website with current publications up to date.

3.2 List of Accredited Journals

The decision in which Journal to attempt a publication is generally a matter a researcher will discuss with his/her supervisor. Make that decision carefully and consult researchers with experience in publishing.

The journals accredited by the Department of Higher Education and Training (DHET) are provided on the [university website](#). A couple of useful accredited examples are:

- JOURNAL OF SOLAR ENERGY ENGINEERING — TRANSACTIONS OF THE ASME
- SOLAR ENERGY (at Elsevier)
- SOLAR ENERGY MATERIALS AND SOLAR CELLS
- RENEWABLE & SUSTAINABLE ENERGY REVIEWS
- EXPERIMENTAL THERMAL AND FLUID SCIENCE
- ENERGY POLICY
- APPLIED ENERGY
- APPLIED THERMAL ENGINEERING

3.3 Important Conferences

3.3.1 SolarPACES

[SolarPACES](#) is THE annual global CSP conference with the who's who in CSP in attendance. Presenting at SolarPACES means exposure and a huge opportunity for networking at the highest level. Many researchers have received very valuable feedback to their work at SolarPACES. All big research institutions and companies are present.

SolarPACES is an annual conference typically hosted in September or October with the abstracts and (double peer reviewed) papers being due end of May and August, respectively. SolarPACES2021 will be hosted in Albuquerque, New Mexico, USA.

3.3.2 SASEC

The SASEC (Southern African Sustainable Energy Conference) is the only regional research conference with focus on sustainable energy. The annual conference is hosted at an institution in Southern Africa. STERG is the major contributor in CSP research. Further separate CSP research from national and international contributors is typically presented. The Proceedings of SASEC 2023 are available [here](#).

3.3.3 Annual STERG Symposium

STERG hosts its annual research symposium (endorsed by SolarPACES) around July each year. The STERG symposium provides postgraduate students with a good opportunity to share their work with a larger audience and is a good dry-run for SolarPACES presentations. The event is typically held over two days, coinciding with the annual Renewable Energy Postgraduate Symposium (REPS), hosted by the Centre for Renewable and Sustainable Energy Studies (CRSES). Details regarding the 7th Annual STERG Symposium will be communicated in due course.

3.4 Previous Proceedings

Leigh keeps a collection of all SolarPACES proceedings since 2006. Contact her for access.

4 Previous STERG Research

Lists of publications (journal articles, conference proceedings, theses, etc.) by STERG members can be found on the STERG website.

5 Physical Infrastructure at STERG

STERG has a number of machines, instruments and systems available to use. A good overview is provided on the [STERG website](#).

5.1 The STERG Roof Laboratory

The STERG roof top laboratory is administered by Dr Willie Smit. Should you wish to make use of the laboratory or any of the equipment available through the laboratory, please contact [Dr. Willie Smit](#) for arrangements.

The normal rules and regulations set out by the Department of Mechanical and Mechatronic Engineering and/or through Mr. Cobus Zietsman apply for the Solar roof top laboratory. Should you intend to run an experimental campaign on the roof lab, please contact Dr Smit early to understand what additional safety implications need to be considered (e.g. bright spots, mirror/heliostat reflection onto neighboring buildings/offices, excessive temperatures, etc.). This is of particular relevance when intending to operate any of the Helio40 infrastructure (heliostats, tower or both). It has shown in the past that early communication helps as most problems can be addressed with adequate safety precautions and processes.

5.2 SUNREC

STERG operates a significant share of the Stellenbosch UNiversity Renewable Energy Centre (SUNREC) at Elsenburg. With any questions towards SUNREC or interest to conduct experiments there, please contact [Prof Craig McGregor](#).

5.3 STERG mini-library

STERG has a mini-library with some useful books available in M4007. To view the titles go to the [SharePoint](#). The library is managed by Leigh.

5.3.1 Procedure for checking out books:

1. note the code of the book you want to take out, e.g. AMBE01 (Available on excel spreadsheet or the book itself)
2. sign the book out in M4007
3. you are responsible for returning the book within four weeks from the date of taking out
4. the book must be signed back in by you personally.

5.4 M4007 Open Plan Office Area Rules

The open plan office space M4007 is shared by STERG students and Thermofluids students. [Leigh](#) and [Jean](#) are the responsible persons for the office area and kitchen M4005 and Leigh manages the desk plan and computers.

The STERG roof top laboratory is administered by Dr Willie Smit. Should you wish to make use of the laboratory or any of the equipment available through the laboratory, please contact [Dr. Willie Smit](#) for arrangements.

STERG students may only be allocated desks by Leigh.

Below are the Department M&M's open plan office rules:

Areas mostly shared by PG students and Postdoctoral fellows.

It is a place of work and all occupants need to respect each other and be accommodating to ensure a pleasant working environment.

The equipment and furniture are and stay the property of the Department and it is expected that it be cared for. No moving of furniture without prior notification & discussion with Mrs Welma Liebenberg.

Please make use of the breakaway areas for discussions and socialising.

5.4.1 Individual's responsibilities:

- Keep your desk and shared spaces tidy and clean. You must clean and dust your own desk and bookshelf.
- Maintain good personal hygiene and avoid behaviour, such as repeated sniffing, that disturbs others.
- You are responsible for the safety of personal items. Please bring your own lock for this purpose to lock the cupboard at your desk. The department reserves the right to cut a lock should it be deemed that your desk was unused for more than 4 weeks.
- No eating or drinking is allowed at your desk for the sake of good hygiene and cleanliness, except that drinking at your desk is allowed from a closed container.
- No visitors or meetings are allowed at your desk. Please use a meeting room or breakaway area.
- Keep your mobile phone on silent.
- No phone conversations are allowed in the office, except for very brief calls. Please use a meeting room or breakaway area for longer conversations.
- Only work-related Skype, MS Teams, Zoom, or similar calls are allowed while other people are in the vicinity. You must use a headset with earphones and a microphone so that you can speak softly and your audio does not disturb others.

- Book a conference room (when available) in advance – M6030 is available for PG students for meetings. Send a meeting request via Outlook Calendar to “M6030W” and you will receive a confirmation if available.
- Meeting rooms are not available for office space, only available for prior booked meetings.
- Always consider your colleagues in the open office areas by not interrupting them with frequent questions and comments, work related or not.
- Discuss any problems / requests / complaints with the responsible person from your Research Group who will discuss it with the Supervisors or refer it to Mrs Welma Liebenberg.

5.4.2 Servest cleaner’s responsibilities:

- Bins emptied 3x/ week.
- Vacuum / floor washed once a week.
- General neatness of the area.