SILTING THEORY AND RELATED TOPICS:
ABSTRACTS AND SCHEDULE

Silvana Bazzoni (University of Padova)
Title: The heart of t-structures induced by n-tilting modules
Abstract: We consider the t-structure induced by an infinitely generated n-tilting R-module and we investigate when its heart is a Grothendieck category.

In a recent paper Parra and Saorín proved that, if T is a 1-tilting module, then the heart is a Grothendieck category if and only if the torsion free class associated to T is closed under direct limits. We proved that the latter condition holds if and only if T is pure projective and showed that there are examples of non finitely generated pure projective 1-tilting modules.

If $n > 1$ we consider a good n-tilting module T and characterize when the heart of the associated t-structure is a Grothendieck category in terms of properties of the category of modules over the endomorphism ring of T. We look also for conditions on the category of R-modules and on the tilting module itself.

Thomas Brüstle (University of Sherbrook/ Bishop's University)
Title: On the non-leaving-face property
Abstract: D. Sleator, R. Tarjan and W. Thurston showed in 1988 that the associahedron satisfies the non-leaving-face property, that is, every graph geodesic connecting two vertices stays in the minimal face containing both. Recently, C. Ceballos and V. Pilaud established the non-leaving face property for generalized associahedra of types B, C, D, and some exceptional types including E6. The key ingredient in the proofs is a normalization, a sort of projection from the associahedron to a face. We use methods from cluster categories to define such a projection, which allows us to establish the non-leaving face property at once for all finite cases that are modeled using cluster categories.

Osamu Iyama (University of Nagoya)
Title: Tilting theory of partial preprojective algebras
Abstract: Let A be a preprojective algebra of non-Dynkin quiver. It is well-known that tilting theory of A can be described in terms of the corresponding Coxeter group W. For an idempotent e of A, the subring eAe of A is called a partial preprojective algebra. Under a certain assumption on e, I will describe tilting theory of eAe in terms of certain pairs (x, e') of elements in W and idempotents e' of A. Moreover I will apply this result to classify cluster tilting (and maximal modifying) modules over cDV singularities, studied recently by Wemyss.

Gustavo Jasso (University of Bonn)
Title: τ-rigid finite algebras
(joint work with Laurent Demonet and Osamu Iyama)
Abstract: The class of support τ-tilting modules was introduced recently by Adachi, Iyama and Reiten so as to complete the class of tilting modules from the viewpoint of mutations. In this talk, I will explain properties of τ-rigid finite algebras, which are algebras having finitely many basic support τ-tilting modules up to isomorphism.

Peter Jørgensen (University of Newcastle)
Title: Co-t-structures: The First Decade
Abstract: Co-t-structures were introduced independently by Bondarko and Pauksztello in 2007 as a mirror image of t-structures.

The two types of structures are related by a "looking glass principle", in the sense that many of their properties are analogous, but translation from one side to the other is rarely mechanical.

We will recall the canonical t-structure in the derived category, show an analogous co-t-structure in the homotopy category, and show an example of a category which is skewed in the sense that it has many t-structures and few co-t-structures, or vice versa.

We will also mention the close relation between t-structures, co-t-structures, simple minded collections, and silting objects.

Martin Kalck (University of Nagoya)
Title: Derived categories of quasi-hereditary algebras
Abstract: (Derived categories of) quasi-hereditary algebras occur in many contexts in geometry, representation theory and Lie theory. I will discuss examples giving some new insights into their structure and report on attempts to characterise these categories among all algebraic triangulated categories.

Frederik Marks (University of Stuttgart)
Title: Silting modules and universal localisations, part 1
(containing joint work with Lidia Angeleri Hügel and Jorge Vitória, and with Jan Šťovíček).
Abstract: Silting modules generalise simultaneously tilting modules over any ring and support τ-tilting modules over finite dimensional algebras. In this talk, we show that silting modules are closely related to ring epimorphisms and universal localisations, as defined by Cohn and Schofield. More precisely, to every partial silting module we can associate an abstract ring epimorphism. In the context of hereditary rings and certain finite dimensional algebras, this assignment allows us to establish bijections between silting modules and universal localisations.

Robert Marsh (University of Leeds)
Title: Rigid and Schurian modules over cluster-tilted algebras of tame type
(joint work with Idun Reiten)
Abstract: We consider cluster-tilted algebras B arising from the cluster category of a tame hereditary algebra. We classify the indecomposable rigid and Schurian B-modules.

Such a cluster-tilted algebra has an associated cluster algebra $A(Q_B)$, where Q_B is the quiver of B. Answering a question of T. Nakanishi, we show that $A(Q_B)$ can have a denominator vector which is not the dimension vector of any indecomposable B-module.

Using the above classification, we show that every denominator vector of $A(Q_B)$ is the sum of the dimension vectors of at most three indecomposable rigid B-modules.

Octavio Mendoza Hernández (National Autonomous University of Mexico)
Title: Homological systems in triangulated categories
(joint work with Valente Santiago)
Abstract: In this talk, we introduce and develope the notion of homological systems for triangulated categories. These systems generalize, on one hand, the notion of stratifying systems in module categories, and on the other hand, the notion of exceptional sequences in triangulated categories.

One of the consequences we get is that attached to an homological system Θ, there are two standardly stratified algebras A and B, which are derived equivalent. That is, the category $\mathcal{F}(\Theta)$, of the Θ-filtered objects in a triangulated category $\mathcal{T}$, admits in a very natural way a structure of an exact category, and moreover there are triangulated equivalences between the bounded derived category of the exact category $\mathcal{F}(\Theta)$ and the bounded derived categories associated to the standardly stratified algebras A and B. Some of the obtained results can be seen also under the light of the cotorsion pairs in the sense of Iyama-Nakaoka-Yoshino. We recall that cotorsion pairs are studied extensively in relation with cluster tilting categories,

t-structures and co-t-structures.

Pedro Nicolás Zaragoza (University of Murcia)
Title: Silting and t-structures
Abstract: We use Derived Morita Theory to get an intrinsic characterization of the t-structures induced by a compact silting dg module. Then, we use some extensions of Derived Morita Theory to get a better understanding of the t-structures induced by a (not necessarily compact) silting dg module.

David Pauksztello (University of Manchester)
Title: From (co)-stability conditions to (co-)t-structures
(This talk will be based on joint work with Peter Jorgensen)
Abstract: In this talk we will look at how one can use a generalisation of (co)-slicings which occur in Bridgeland (co)-stability conditions to classify (co)-t-structures. We will use the Kronecker algebra to serve as an example.

Chrysostomos Psaroudakis (Norwegian University of Science and Technology)
Title: The Realisation Functor and Derived Equivalences for Abelian Categories
(joint work with Jorge Vitória)
Abstract: In this talk we show how to obtain derived equivalences for abelian categories from not necessarily compact tilting and cotilting objects. The key ingredients of this result are the realisation functor of Beilinson-Bernstein-Deligne and a notion of (co)tilting objects in triangulated categories that we introduce. The first part of the talk is devoted to explaining the realisation functor. We then continue by discussing (not necessarily compact) (co)silting objects in appropriate triangulated categories and in the last part we present the main result. As a particular case we explain how derived equivalences between Grothendieck categories can be realised as cotilting equivalences.

Idun Reiten (Norwegian University of Science and Technology)
Title: Quotients of preprojective algebras and Weyl groups
(joint work with Osamu Iyama, Nathan Reading and Hugh Thomas)
Abstract: For a preprojective algebra A of Dynkin type, the lattice $tors(A)$ of torsion classes in $mod(A)$ is isomorphic to the Weyl group. The join irreducible elements in $tors(A)$ are in bijection with the indecomposable tau-rigid A-modules. We show that there is a map from factor algebras of A to the lattice quotients of $tors(A)$, given by sending the factor algebra A/I to $tors(A/I)$, where I is an ideal in A. We call a lattice quotient of $tors(A)$ of the form $tors(A/I)$ an algebraic lattice quotient. In Dynkin type A (simply laced case), we give characterizations of lattice quotients which are algebraic, using what we call double join irreducible elements. We also give a more explicit description of the algebraic lattice quotients of $tors(A)$, or equivalently, of the associated Weyl group. Basic definitions and results will be explained in the lecture.

Jan Šťovíček (Charles University in Prague)
Title: Silting modules and universal localizations, part 2
(containing joint work in progress with Frederik Marks)
Abstract: I will discuss aspects of the theoretical connection between infinite silting and tilting theory and universal localizations. I will treat the questions on
a) how far the abstract ring epimorphisms associated with partial silting modules are from universal localizations, and
b) how far universal localizations are from homological epimorphisms.

Tentative schedule:

Thursday July 2	
$9:00-9:30$	*Registration*
$9:30-10:20$	Reiten
	Quotients of preprojective algebras and Weyl groups
	coffee
$11:00-11:50$	Jørgensen
	Co-t-structures: The First Decade
$12:00-12:50$	Pauksztello
	From (co)-stability conditions to (co-)t-structures
	lunch break
$15:00-15:50$	Marks
	Silting modules and universal localisations, part 1
	coffee
$16:30-17:20$	Stovicek
	Silting modules and universal localisations, part 2
$20:00$	*dinner at Agriturismo San Mattia*

Friday July 3	
$9:00-9:50$	Bazzoni
	The heart of t-structures induced by n-tilting modules
$10:00-10:50$	Nicolás
	Silting and t-structures
	coffee
$11:30-12:20$	Psaroudakis
	The Realisation Functor and Derived Equivalences for Abelian Categories
	lunch break
$14:30-15:20$	Kalck
	Derived categories of quasi-hereditary algebras
	coffee
$16:00-16:50$	Mendoza
	Homological systems in triangulated categories
$17:00-17:50$	Jasso
	$\tau-$ rigid finite algebras

Saturday July 4	
$9:00-9:50$	Brüstle
	On the non-leaving-face property
$10:00-10:50$	Marsh
	Rigid and Schurian modules over cluster-tilted algebras of tame type
	coffee
$11:30-12:20$	Iyama
	Tilting theory of partial preprojective algebras